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METABOLIC STUDIES ON PATIENTS WITH GOUT

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The cause of gout is unknown, although most data concerning the pathogenesis indicate that it is a metabolic dyscrasia rather than an infectious or a deficiency disease. In affirming that gout is a metabolic dyscrasia we choose to employ a liberal interpretation of this term and imply a disturbance of function, be it chemical, physical or hormonal. Investigations of the chemical changes associated with acute and with chronic gout have been concerned principally with the variation in concentration of uric acid in the blood and in other body fluids. At present it is accepted that gouty arthritis is accompanied by an increased concentration of uric acid in the blood. Agreement is lacking, however, concerning the mechanism of this increase and the fate of this substance in body economy.

Data were presented from this laboratory in 1935 [1] which indicated that gout is accompanied by changes in the body more widespread than seemingly could be accounted for by a dysfunction in the excretion or formation of uric acid. These data were derived from a study of the water and electrolyte exchange in two patients during recurrent attacks of gouty arthritis. One patient had no articular deformity at the time this study was made. The other patient had mild deformities of the joints of the hands and the feet. Since this earlier report, observations have been made on patients without demonstrable evidence of chronic gouty arthritis as well as on patients with deforming articular involvement. The distinction between acute and chronic gout is believed to be relative, and we agree with Kinglake [2] that: "The terms signify different degrees of the same affection. They imply no sort of distinction in the quality of the disease, but merely in its quantity or force."

SUBJECTS

In this report data from twenty-four patients (table 1) with acute or chronic gout as well as data from control subjects will be discussed. Twenty-two of the gouty patients were males and two were females. The two women, K. He. and M. Tr., had, in addition to the usual manifestations of the disease,[3] subcutaneous tophi, from which urate crystals were removed. Each male patient had had two or more attacks of acute arthritis, and on two or more occasions the concentration of uric acid in the serum was greater than 6 mg. per hundred cubic centimeters. Osseous tophi were suspected from the roentgenograms in nineteen of the males. Thirteen had soft tissue tophi containing urate crystals. All the patients seen during an acute attack responded to full doses of colchicine. The seven patients who acted as controls were suffering, respectively, from the following conditions: myxedema, diabetes insipidus, diabetes mellitus, rheumatoid arthritis, undernutrition and urate lithiasis.

METHODS

The metabolic data were collected while the patients were hospitalized in the metabolism ward of the Massachusetts General Hospital. Approximately the same number of hours of sleep were obtained at night by each patient. During the day they were ambulatory if asymptomatic, although physical activity was restricted. The daily fluid intake was selected as follows: Each patient chose an amount of fluid suitable for extradietary consumption. When the selection had been made, the fluid intake was constant in the periods of freedom from acute articular symptoms.

All the patients with gout were observed for a minimum of three days on a low purine diet and twelve for three or more weeks. Although medication was required for control of symptoms, all twenty-four patients were observed for at least three days on a low purine diet without medication. When no mention is made to the contrary, it may be assumed that the patient consumed a constant amount of fluid and food each day and that no medicine was administered.

The methods for analysis of the chemical constituents of the blood and urine have been described previously.[1] The procedure for determining the insensible loss of weight was similar to that described by Benedict and Root.[4] A silk scale accurate to 10 Gm. was used for measurement of body weight. An especially constructed stretcher was used when the patients were not ambulatory. At night, before going to sleep, the patient voided and was weighed. The following morning, approximately nine hours later and before the patient voided, a second weight was obtained. All the data on insensible loss of weight were collected in the late winter and early spring. The meteorologic observations,

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1. Talbott, J. H.; Jacobson, B. M., and Oberg, S. A.: The Electrolyte Balance in Acute Gout, J. Clin. Investigation **14**: 411 (July) 1935.
2. Kinglake, Robert: A Dissertation on Gout, London, J. Murray, 1804.
3. Hench, P. S.: The Diagnosis of Gout and Gouty Arthritis, J. Lab. & Clin. Med. **22**: 48 (Oct.) 1936.
4. Benedict, F. G., and Root, H. F.: Insensible Perspiration: Its Relation to Human Physiology and Pathology, Arch. Int. Med. **38**: 1 (July) 1926.

barometric pressure, relative humidity and external temperature were obtained from the Weather Bureau, United States Department of Agriculture, Boston.

ANALYSIS OF RESULTS

The data to be presented may be divided conveniently into three parts: (1) The fate of uric acid in gouty patients with and without demonstrable evidence of damage to the kidneys, (2) cyclic changes in the metabolic processes of the body during arthritis-free periods as well as during acute attacks and (3) the treatment of acute and chronic gout.

The Fate of Uric Acid in the Body.—Although it has long been known that gout is accompanied by an increased concentration of uric acid in the blood, the mechanism of this increase has not been established. Since uric acid is an organic substance normally present in the body, it is conceivable that one of three processes or a combination of them might be responsible for this increase. These are (*a*) diminished excretion, (*b*) diminished destruction and (*c*) increased formation.

In the gouty patient past the age of 50 with clinical evidence of renal insufficiency,[5] the increased concentration of uric acid, it is believed, may be a function of poor elimination. However, prolonged observation of patients without demonstrable renal disease who are on a low purine regimen does not justify the general application of this assumption.

Before we present data concerning the gouty patients, observations on two controls will be discussed. The first subject had rheumatoid arthritis with moderate involvement of the joints as judged from the physical examination and roentgen studies. The second had renal lithiasis, and, although he had passed several urate calculi, it was not believed that he was suffering from gout. Both were observed on a low purine diet for nine days. Both had normally functioning kidneys, judging from the medical history and the clinical tests for renal function. The concentration of nonprotein nitrogen and of uric acid in the serum were normal in each patient at two determinations. The maximum daily concentration of uric acid in the urine for the patient with rheumatoid arthritis was 28 mg. per hundred cubic centimeters, and for the patient with urate calculi it was 48 mg. These observations correspond to those of Grafe[6] and Loewenhardt[7] for nongouty subjects.

Similar studies on patients with gout showed certain contrasts. It may be noted in table 2 that eight patients were able to concentrate uric acid in the urine in an amount greater than 75 mg. per hundred cubic centimeters. All but one of these was less than 50 years of age, and all except this patient excreted more than 25 per cent of phenolsulfonphthalein in the first fifteen minutes after intravenous injection of 0.6 mg.[8] For none of the eight was the specific gravity of the urine fixed below 1.014, and none showed a diastolic blood pressure greater than 98 mm. of mercury. It is believed these patients with gout had no renal insufficiency and that their kidneys, therefore, were able to excrete water and solids and to concentrate uric acid. Two of the patients were studied for long periods, with results that indicate that the foregoing data are representative and are not exceptional or chance observations. From Jan. 21 to Feb. 9, 1934, patient F. Mc. had no symptoms of acute arthritis; nevertheless, the concentration of uric acid in the urine was greater than 50 mg. on twelve days and less than 50 mg. on eight days. The maximum concentration observed was 112 mg. From May 3 to 15, 1934, patient F. Na. showed a concentration of uric acid in the urine greater than 50 mg. on six days. The maximum concentration observed was 127 mg. During periods of acute symptoms both of these patients were able to excrete urine with a greater concentration than that observed during symptom-free periods. On the other hand, most of the patients who were unable to concentrate uric acid in an amount above 50 mg. in symptom-free periods had demonstrable evidence of renal damage. Ten of the twelve patients in this second group excreted less than 25 per cent of phenolsulfonphthalein in the first fifteen minutes after injection. The specific gravity of the urine of five patients was

TABLE 1.—*Observations on Twenty-Four Patients with Gout*

Patient	Nationality	Age at Onset, Years	Age in 1937, Years	First Symptoms	Recovery of Urate Crystals: Tophi in Soft Tissue	Recovery of Urate Crystals: Osseous Tophi	Response to Colchicine in Acute Attack	Concentration of Serum Uric Acid: No. of Determinations	Concentration of Serum Uric Acid: Maximum Mg. per 100 Cc.	Concentration of Serum Uric Acid: Minimum Mg. per 100 Cc.	Complications
L. An.	Italian	35	55	Foot	+	+	Satisfactory	3	9.2	8.8	
W. G. B.	German	51	76	Foot	+	+	Satisfactory	4	7.1	6.7	Paget's disease
W. J. B.	German-American	41	45	Ankle	0	0	Unknown	2	6.6	6.2	Paget's disease
A. Ca.	American	34	71	Foot	+	+	Satisfactory	55	10.0	7.7	Duodenal ulcer
J. Ca.	Italian	45	47	Wrist	+	+	Satisfactory	7	8.5	6.2	
A. Ch.	American	22	36	Knee	0	0	Satisfactory	3	11.4	6.6	Migraine
T. Ch.	American	25	65	Ankle	+	+	Satisfactory	5	7.2	5.7	Lymphoma of eye
M. Co.	Jewish	30	48	Foot	+	+	Satisfactory	3	8.4	6.7	Migraine
J. Co.	Italian	40	79	Foot	0	0	Satisfactory	6	8.8	6.5	Duodenal ulcer
C. Cr.	Irish-American	29	41	Foot	+	0	Satisfactory	9	9.6	7.9	Pulmonary tuberculosis
D. Cr.	Irish-American	35	36	Foot	0	0	Satisfactory	2	9.3	8.5	
W. Da.	American	16	59	Foot	0	0	Satisfactory	5	9.6	6.2	
E. Dw.	Irish-American	41	43	Knee	0	0	Satisfactory	3	12.8	10.4	
P. Fa.	Italian	54	64	Foot	0	0	Satisfactory	2	8.8	8.4	
L. Go.	Jewish	33	39	Foot	0	0	Satisfactory	5	8.0	7.0	
T. Gr.	American	33	36	Foot	+	0	Satisfactory	3	8.9	7.0	
K. He.	Irish-American	14	47	Feet	+	+	Satisfactory	8	9.1	8.2	Nodular goiter
F. Mc.	Irish-American	12	25	Feet	+	+	Satisfactory	26	14.2	7.8	
L. Mu.	American	21	26	Foot	0	0	Satisfactory	6	10.0	7.5	
F. Na.	American	21	31	Ankle	+	+	Satisfactory	68	13.1	6.9	
W. Ri.	American	18	74	Foot	+	+	Satisfactory	4	10.8	8.3	
L. Sa.	Italian	41	50	Foot	+	+	Satisfactory	2	9.6	8.2	
M. Tr.	Irish-American	27	38	Foot	+	+	Satisfactory	6	10.2	7.1	Migraine
V. Tr.	Italian	52	54	Feet	0	+	Satisfactory	6	7.2	6.4	

5. Schnitker, M. A., and Richter, A. B.: Nephritis in Gout, Am. J. M. Sc. **192**: 241 (Aug.) 1936.

6. Grafe, E.: Die Krankheiten des Stoffwechsels und ihre Behandlung, Berlin, Julius Springer, 1931.

7. Loewenhardt, F. E. R.: Besteht bei der Gicht eine Partiorfunktionsstörung der Niere fur die Harnsäureausscheidung, Klin. Wchnschr. **1**: 2319 (Nov. 18) 1922.

8. Chapman, E. M., and Halstead, J. A.: The Fractional Phenolsulfonphthalein Test in Bright's Disease, Am. J. M. Sc. **186**: 223 (Aug.) 1933.

fixed at 1.012 or less, and in a similar number the diastolic blood pressure was greater than 98 mm. The excretion of uric acid associated with a low purine diet was not determined for four patients, and in table 2 only studies of renal function are given for these patients.

No evidence was obtained in these studies which pertained to the hypothesis of Brugsch [9] that gouty patients show a diminished destruction of uric acid in the body. In refutation of this assumption, however, the data of Folin [10] should be mentioned. In three patients with gout he noted that the injection of uric acid was followed by as rapid a disappearance of the substance as in normal controls. Uricolytic enzymes are not distributed generally throughout the body,[11] and we believe that the fate of most of the uric acid in the blood and other body fluids is either excretion or deposition.

The third hypothesis for the elevation of the uric acid content in the blood of gouty patients, i. e., increased formation, seems to us to be the most acceptable. The concentration of uric acid in the serum was 10 mg. per hundred cubic centimeters or greater in eight of the twenty-four patients. Five of the eight were less than 40 years of age, had normally functioning kidneys and were able to concentrate uric acid in the urine in an amount greater than 50 mg. Both F. Mc. and F. Na., neither of whom showed renal insufficiency, excreted more than 2 Gm. of uric acid daily while on a low-purine diet in attack-free periods. On a similar diet two control patients without gout excreted less than 1 Gm. daily. It is thus apparent from our data that in the first years after the onset of articular symptoms gouty patients show no constitutional inferiority of the kidneys in regard to the excretion of uric acid. We believe further that any inferiority which may be demonstrated later is related to renal damage which is secondary to the prolonged and excessive excretion of uric acid.

The formation of urate calculi in gouty and non-gouty [12] patients should be mentioned in this section. Urate stones sufficiently large to produce colic were passed by four of the patients with gout; in two, renal colic preceded symptoms of arthritis. On the other hand, six patients referred to us by Dr. Fuller Albright were examined for gout because they had passed urate calculi. A history of articular disturbance was investigated, the concentration of serum uric acid was determined and roentgenograms were taken of the hands and the feet. No additional evidence was obtained in any of these cases which suggested a diagnosis of gout. We conclude, therefore, that urate calculi may accompany the prolonged and excessive excretion of urates in patients with gout but that the passage of a urate stone does not imply a presumptive diagnosis of gout.

Cyclic Changes in Metabolic Processes.—An alteration in the concentration of certain constituents of the body fluids during an acute attack of gout has been known for many years. His,[13] Futcher [14] and others observed a diminished urinary excretion of urate before the onset of acute symptoms, this being followed in a few days by an increased excretion. With patients on a low purine diet, this observation was not only confirmed by us but was extended to include other constituents of the body fluids and other functions of the body.

A frequent observation while patients were consuming a constant amount of food and fluid was a diuresis which immediately preceded an acute attack of gout.[1] This diuresis began from twenty-four to seventy-two hours before the onset of articular symptoms and the elevation of body temperature. It was accompanied by an increased excretion as well as an increased concentration of various urinary constituents but especially of sodium and chloride (fig. 1). The maximum output of fluid was noted immediately before or on the day of maximum articular distress and was approximately twice the daily output observed prior to the diuresis.

TABLE 2.—*Cardiovascular-Renal Studies*

Patient	Age	Duration of Symptoms, Yr.	Blood Pressure, Mg. Hg	Excretion of Phenolsulfonphthalein,* Percentage	Specific Gravity of Urine†	Albuminuria‡	Maximum Concentration of Uric Acid in Urine, Mg. per 100 Cc.
L. An.	55	20	120/ 84	21	16	0	44
W. G. B.	76	25	140/ 96	19	17	+	87
W. J. B.	45	4	190/104	1	10	0	46
A. Ca.	71	37	112/ 70	5	12	+	42
J. Ca.	47	2	120/ 84	55	14	0	45
A. Ch.	36	14	118/ 68	26	..	0	83
T. Ch.	65	40	130/ 84	15	16	0	49
M. Co.	48	18	120/ 80	36	16	0	78
J. Co.	79	39	174/ 78	14	14	0	38
C. Cr.	41	12	148/102	2	8	++	38
D. Cr.	36	1	136/ 82	27	26	0	106
W. Da.	59	43	142/ 88	17	18	0	34
E. Dw.	43	2	148/ 96	30	24	0	79
P. Fa.	64	10	190/108	30	18	0	..
L. Go.	39	6	120/ 80	18	20	0	42
T. Gr.	36	3	144/100	11	20	0	..
K. He.	47	33	104/ 76	8	13	++	11
F. Mc.	25	13	120/ 80	33	20	0	127
L. Mu.	27	5	138/ 84	33	14	+	93
F. Na.	31	10	124/ 90	25	20	0	112
W. Ri.	74	56	140/ 78	9	8	0	48
L. Sa.	50	9	130/ 80	20	8	0	..
M. Tr.	34	11	170/110	7	14	+++	28
V. Tr.	54	2	155/100	26	24	0	..

* Percentage of dye excreted in first fifteen minutes after injection.
† Maximum specific gravity in four hourly collections following abstinence from food and fluid for eleven hours. Only significant figures are given.
‡ A scale of + to ++++ is employed.

On the day of the maximum diuresis an increased excretion of urate was observed, which undoubtedly corresponded with the increased output noted by His and by Futcher. The increased excretion of water and salt subsided presently and was followed by a diminished excretion. These fluctuations in excretion tended to recur in patients having frequent attacks of acute gout, and it seemed appropriate to apply the term gout cycle to describe them.

It was observed further that in the prodromal period before the onset of acute gout a gain in body weight accompanied the diuresis. It was assumed that with a constant regimen only a significant diminution in insensible loss could explain this paradoxic phenomenon.[1] Study of the precise changes in insensible loss during the prodromal period has confirmed this assumption. These changes were illustrated in two acute cycles in patient F. Mc. (fig. 2). During the three days beginning February 3, the diuresis plus the gain in body weight was about 1,600 Gm. At the same time the decrease in insensible loss of weight was more than 1,700 Gm. Again, during the two day period before February 10 the diuresis plus the gain in weight was

9. Brugsch, T.: Die Stoffwechselpathologie der Gicht, Ztschr. f. exper. Path. u. Therap. **2**: 619, 1905.
10. Folin, Otto; Berglund, Hilding, and Derrick, Clifford: The Uric Acid Problem: An Experimental Study of Animals and Man, Including Gouty Subjects, J. Biol. Chem. **60**: 361 (June) 1924.
11. Thannhauser, S. J.: Lehrbuch des Stoffwechsels und der Stoffwechselkrankheiten, Munich, J. F. Bergman, 1929.
12. von Müller, F.: Ueber die uratische Diathese, Wien. klin. Wchnschr. **50**: 1291 (Sept. 17) 1937.
13. His, Wilhelm: Die Ausscheidung von Harnsaure im Urin der Gichtkranken, mit besonderer Berucksichtigung der Anfallszeiten und bestimmer Behandlungs methoden, Deutsches Arch. f. klin. Med. **65**: 156, 1899.
14. Futcher, T. B.: Gout, in Osler, Sir William, and McCrae, Thomas: Modern Medicine, ed. 2, Philadelphia, D. Appleton & Co., 1914, vol. 2.

approximately 1,900 Gm., while the diminution in insensible loss was about 1,800 Gm. That as great a cyclic change in insensible loss is not a physiologic function common to many patients may be deduced from our failure to observe similar changes in several controls. During the period of observation just mentioned, a patient with urate lithiasis without gout showed a minimal variation in daily output of fluid and minimal changes in daily insensible loss.

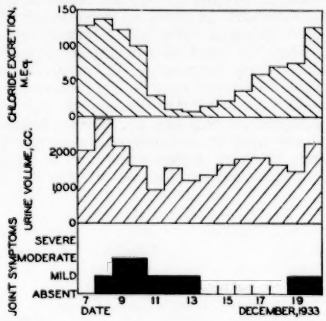

Fig. 1 (case 17).—Increased excretion of water and chloride during two acute attacks of gout in patient of 21.

In a six week period of observation on patient F. Na.,[15] simultaneous determinations of insensible loss of weight were made on three control patients studied consecutively. During fourteen days of observation of a patient with diabetes insipidus, the maximum variation in insensible loss was 10 Gm. an hour. At the same time the cyclic variation in F. Na. was about 40 Gm. an hour. The control patient was then replaced for an eight day period by a patient with myxedema and later for an eleven day period by a patient with rheumatoid arthritis. The maximum daily variation in insensible loss by these two control patients was 11 Gm. an hour. The maximum variation in F. Na. during these periods was 37 and 31 Gm. an hour, respectively. In F. Mc. the diminution in insensible loss during both cycles was followed by acute arthritis; in F. Na. two of the three cycles were accompanied by acute symptoms.

The term gout cycle as originally employed included only the rhythmic changes which accompany the acute articular symptoms, as at that time no studies had been made of prolonged periods between attacks. Continued study of patients with gout has caused us to alter our former deductions. It is now believed that cyclic changes in the internal environment of the body similar to those observed during acute articular gout may occur also during symptom-free periods, and in all patients with gout whom we have studied the disease has been a continually recurring phenomenon irrespective of the presence or the severity of acute symptoms.

The cyclic variation in insensible loss, urinary volume and body weight has been studied in seven patients during twenty-four periods of from five to eight days each. In fourteen cycles acute gouty arthritis followed the decrease in insensible loss; in ten this decrease occurred without an exacerbation of articular symptoms. The majority of the symptom-free cycles, however, were not associated with as great a variation in metabolic changes as were the cycles with acute gout. It seemed impossible, however, to predict whether or not a decrease in insensible loss during any one cycle would be followed by acute arthritis. This is illustrated in figure 3, in which two cycles are shown graphically for patient J. Co. From April 10 to 13, 1936, the diminution in insensible loss exceeded 70 Gm. an hour. After this decrease, a second maximum was reached on April 16. The first diminution in insensible loss was followed by an acute attack, while the second was not.

In the search for an explanation of this continuous cycle variation, which occurred with and without acute articular symptoms, a possible relation to meteorologic changes was considered. In this aspect of the study, barometric pressure, relative humidity and atmospheric temperature, observed at 8 o'clock each morning, were compared with daily changes in insensible loss and urinary volume. When most of these observations had been charted, a consistent correlation was noted between changes in barometric pressure, insensible loss of weight and diuresis. In the symptom-free periods a fall in barometric pressure preceded the diuresis by approximately twelve hours. In cycles with acute symptoms the maximum fall in barometric pressure preceded the diuresis and the articular symptoms by from twelve to twenty-four hours. Figure 3 shows that the diminution in barometric pressure and the insensible loss occurred at approximately the same time. There was chronologic agreement in eleven of the fourteen attack cycles and in all the symptom-free cycles. The fluctuations in external temperature and relative humidity were greater and more variable than those in barometric pressure, and no obvious relationship was noted between these observations and the gout cycle. It is possible that a subtle correlation between these variables exists, but it was not evident from our studies.

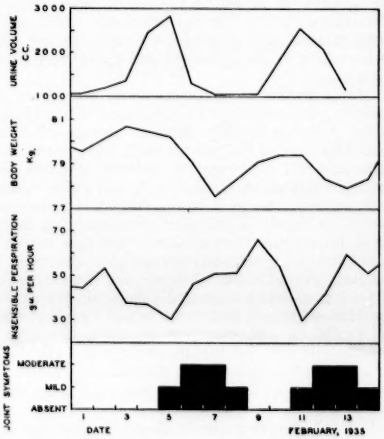

Fig. 2 (case 17).—Changes in urinary volume, body weight and insensible perspiration during two attacks of acute gout in patient of 23.

This quantitative study has given us new information about the patient with gout and laboratory evidence

15. Ludwig, A. O.; Bennett, G. A., and Bauer, Walter: A Rare Manifestation of Gout; Widespread Ankylosis Simulating Rheumatoid Arthritis, Ann. Int. Med. **11**: 1248 (Jan.) 1938.

in support of certain clinical observations. There are patients with gout who believe that they can predict an acute attack of arthritis from an increased urinary output,[16] gastrointestinal distress,[17] suppression of sweating or gain in body weight. Although it is not common for the patient with gout to forecast a storm from symptomatic changes in his joints, as the patient with rheumatoid arthritis frequently does, an observation published in 1816 by Scudamore [18] partially refutes this statement: "I know several gouty patients, whose sensibility to the immediate influence of the east wind . . . is almost inevitable." It is recognized that an east wind generally accompanies a falling barometric pressure, and the association of meteorologic changes and symptoms of gout may be greater than is now appreciated.

In summary, we have stressed the occurrence of cyclic changes in certain metabolic functions of patients with gout. These changes have been observed in periods with and without symptoms of acute arthritis. In several control patients without gout, the magnitude of the change of these variables was significantly less.

Treatment.—During the periods of study and the collection of the foregoing metabolic data, certain observations were made concerning treatment. It is our belief that there is no known cure for gout and that once the diagnosis is confirmed the disease will persist until the patient dies. On the other hand, much may be done to afford symptomatic relief, especially during acute attacks, when rest in bed, abundant fluids and a soft diet are indicated. Probably the most important drug to give is colchicine. In the crystalline form [19] this preparation is more reliable than the wine or tincture of colchicum, the potency of which may vary. For acute symptoms colchicine may be prescribed in amounts of $\frac{1}{120}$ grain (0.0005 Gm.), to be taken every one or two hours until eight, twelve or even sixteen doses have been ingested. The symptoms of adequacy are associated with the development of nausea, vomiting or diarrhea. Many patients learn from practice the optimum number of pills to take and thereby obtain the desired alleviation of articular pain without the undesirable intestinal symptoms.

The mechanism of the action of colchicine is not known. Few pharmacologic studies have been made, and we can say little more than that it is effective clinically. It has been given by us repeatedly to patients having frequent attacks, and we have not observed any untoward symptoms or signs other than those just discussed. We have not observed a patient to be hypersensitive to this drug, nor does the drug appear to lose its efficacy with repeated ingestion.

The treatment of gout during arthritis-free periods has been and continues to be a subject for argument. Innumerable regimens and diets have been proposed, the merits of which are difficult to evaluate. There is no index of therapeutic efficiency comparable to the alleviation of pain during acute attacks, and it is our belief that the number and duration of attacks a year is the best index of the worth of any regimen. Within limits we believe that deposition of sodium urate is greater and the osseous involvement more extensive with frequent and prolonged attacks than with infrequent attacks of short duration.

The protein content of the diet and the alcoholic content of fluids have been the battleground for most discussions of the treatment of the chronic form.[20] Most clinicians favor the exclusion from the diet of foods with a high purine content, a practice with which we are in agreement. We believe that the benefits of a low protein and a scrupulously low purine diet, however, have been exaggerated. Evidence supporting our belief was obtained from patients F. Na. and F. Mc. In three periods, totaling more than 7 months, F. Na. was observed in the metabolism ward on a low purine diet. During this time he had twelve attacks of acute arthritis and had severe gout on twenty-seven days. In the following eight months, at home, in which he was on a diet of his own selection, without restriction of purine, he had seven acute attacks and had severe gout on eighteen days. Colchicine taken during the acute attacks was the only medicine taken regularly during both periods.

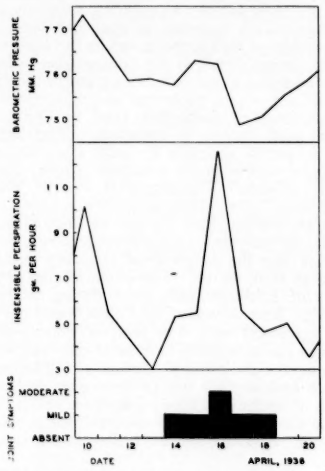

Fig 3 (case 9).—Changes in barometric pressure and insensible perspiration during two cycles in patient of 78.

Similar data were obtained from F. Mc. During a nine month period in the hospital on a low purine diet he had twenty-one attacks of acute arthritis and spent thirty-nine days in bed with severe gout. In the fourteen months after discharge he had seven acute attacks and spent only seven days in bed. In this period, at home, he had red meat at least once a day and enjoyed a moderate intake of beer and occasionally hard liquor. In the hospital he was given no medicine regularly except colchicine for acute symptoms. At home he took colchicine for acute symptoms, and, in addition, from 40 to 60 grains (2.4 to 4 Gm.) of acetylsalicylic acid daily. At the end of the second period he began a third, which lasted twenty-six months. In this period he took, in addition to acetylsalicylic acid, $\frac{3}{120}$ grain (0.0015 Gm.) of colchicine daily. During this time he had seven acute attacks of gout

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17. Lichtwitz, Leopold: Gout, Bull. New York Acad. Med. **10**: 306 (May) 1934.
18. Scudamore, C.: A Treatise on the Nature and Cure of Gout, ed. 4, London, 1823.
19. In the United States colchicine may be obtained from Abbott Laboratories, Merck & Co., and Parke, Davis & Co.
20. Brogsitter, A. M.: Diät für Gichtkranke, ed. 3, Stuttgart, 1937.

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and spent eight days in bed. Clinically there appeared to be no greater progression of the articular changes while he was receiving a liberal purine intake than when he was in the hospital on a low purine diet. It is of interest that during the four year period of observation the number of attacks a year and of days spent in bed during the low purine regimen was about tenfold that observed while the patient was eating a liberal portion of meat each day.

The experience of J. Co. may be cited, although we have no control observations for comparison. This patient is now 79 years of age and has had articular symptoms for more than forty years. During this time he has been a bartender and has consumed a liberal amount of alcoholic beverages as well as of red meat each day. For the past fifteen years he has had one or two mild attacks of acute arthritis annually. He has large aural tophi but has no crippling deformity of his extremities. If a diagnosis of gout had been made after the onset of his symptoms and he had been placed on a low purine diet, it is not unreasonable to believe that undue credit would have been given to the diet.

The efficacy of the prolonged use of acetylsalicylic acid, colchicine or cinchophen (and its derivatives) between acute attacks is uncertain. Acetylsalicylic acid is frequently desirable for mild aches and pains and may be used as in the treatment of other types of arthritis. Hench,[21] Thannhauser,[11] Pratt,[22] Volini,[23] Herrick [24] and others have stated the conviction that benefits are derived from the use of cinchophen. In our series we have used cinchophen infrequently because we believe that the danger from poisoning outweighs the benefits from its use. The administration of small amounts of colchicine each week during attack-free periods has been advocated by Cohen,[25] and our data are in agreement with this practice. Many of the patients in our series who have more than two attacks of gout a year are given $^3/_{120}$ grain (0.0015 Gm.) of colchicine each day for two or three days each week. The use of colchicine in this amount in several cases for more than two years has not produced any recognized toxic symptoms, and we believe that it is a safe practice.

A liberal fluid intake is important, as well as a reducing diet for those who are overweight.[22] A diet adequate in minerals and vitamins would appear obvious, although there is no convincing evidence that massive doses of either minerals or vitamins have any particular merit.

SUMMARY AND CONCLUSIONS

Twenty-four patients with gout were studied.

The increased concentration of uric acid in the blood is believed to be a function of increased formation rather than of diminished excretion or of destruction.

The term gout cycle was used to describe a cyclic variation in water and salt exchange observed during arthritis-free periods and during acute attacks. Accompanying the increased excretion of water and salt, there was a gain in body weight and a diminution in insensible loss of weight. The changing metabolic functions appeared to be associated with changes in barometric pressure.

In the treatment of acute gouty arthritis, the use of crystalline colchicine has been very satisfactory. In asymptomatic periods, the prolonged use of a low purine and a low protein diet seems to possess no particular merit. It is our belief that a diet adequate in protein, carbohydrate, fat, vitamins, minerals and fluids should be prescribed for most patients with gout.

21. Hench, P. S.: The Diagnosis of Gout and Gouty Arthritis, Proc. Staff Meet., Mayo Clin. **11**: 476 (July 22) 1936.
22. Pratt, J. H.: Gout, in Cecil, Russell L.: A Textbook of Medicine, ed. 4, Philadelphia, W. B. Saunders Company, 1937.
23. Volini, I. F.: Gout: A Report of Ten Cases for the Year 1935, M. Clin. North America **21**: 3 (Jan.) 1937.
24. Herrick, W. W., and Tyson, T. L.: Gout—A Forgotten Disease, Am. J. M. Sc. **192**: 483 (Oct.) 1936.
25. Cohen, Abraham: Gout, Am. J. M. Sc. **192**: 488 (Oct.) 1936.

ROLE OF CARBON MONOXIDE IN THE CAUSATION OF MYOCARDIAL DISEASE

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In the course of study of a large group of patients whose illness could unquestionably be attributed to frequent and prolonged exposure to carbon monoxide gas, we were forcibly impressed with the frequency with which cardiac symptoms appeared. In most instances these symptoms were chiefly functional. However, in some cases the clinical manifestations were predominantly those of organic heart disease.

Carbon monoxide chemically considered is nontoxic; that is, it has no direct effect on the tissues of the body. Its injurious action is due indirectly to its extraordinary affinity for hemoglobin, because of which the oxygen of the oxyhemoglobin molecule is replaced by carbon monoxide, thus producing a state of anoxemia. In consequence of this anoxemia, functional disturbances arise. These are due primarily to mere oxygen want and secondarily to the anoxemic lesions produced through oxygen deprivation.

Structures endowed with a rich blood supply, such as the myocardium and the central nervous system, normally utilize more oxygen than those less abundantly supplied; consequently, in states of anoxemia the damage to tissue in these organs is relatively more pronounced.

Carbon monoxide anoxemia does not differ essentially from anoxemia associated with severe forms of anemia. The factor responsible in both instances is the diminished oxygen-carrying capacity of the hemoglobin.

In recent years much evidence has accumulated showing a definite relationship between anoxemia and cardiovascular disease, as witnessed clinically and at autopsy, in cases of carbon monoxide poisoning and in experiments with animals exposed to carbon monoxide.

Attention has been directed to the association of angina pectoris and pernicious anemia, the former being attributed to the anoxemia produced by the latter. Keefer and Resnik [1] stated the opinion that anoxemia is a constant factor in angina pectoris and that it is possible to demonstrate anoxemia in all cases. Elliott,[2] who reported a case of angina pectoris with severe anemia in the presence of healthy coronary arteries and aorta, expressed the belief that the occurrence is more than a coincidence. His observations are in accord with those of Cabot,[3] who reported three cases

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1. Keefer, C. S., and Resnik, W. H.: Angina Pectoris: A Syndrome Caused by Anoxemia of the Myocardium, Arch. Int. Med. **41**: 769 (June) 1928.
2. Elliott, A. H.: Anemia as the Cause of Angina Pectoris in the Presence of Healthy Coronary Arteries and Aorta: Report of Case, Am. J. M. Sc. **187**: 183-190 (Feb.) 1934.
3. Cabot, R. C.: Facts About the Heart, ed. 1, Philadelphia, W. B. Saunders Company, 1926.

in which intense and typical angina was associated with pernicious anemia without changes in the coronary arteries. That angina pectoris may occur without associated coronary disease has also been affirmed by Allbutt,[4] who cited fifteen cases in which the coronary vessels appeared normal at autopsy. He expressed the opinion that the anginal syndrome occurring in association with coronary or aortic disease is produced by anoxemia of the myocardium.

PATHOLOGIC PHYSIOLOGY

Campbell [5] observed in physiologic experiments with carbon monoxide on tissue oxygen tension a striking resemblance to the effects of hemolysis, bleeding and breathing oxygen at very low pressure. The effects on animals of prolonged exposure to carbon monoxide were an increase in hemoglobin and an increase in the number of red cells per cubic millimeter of blood. These results are similar to those recorded by Nasmith and Graham [6] in 1906. With the gradual increase of the red cells there was a corresponding increase in the amount of carbon monoxide the animals could tolerate.

By exposing animals (rabbits, guinea pigs, rats and mice) to a relatively low percentage of carbon monoxide (0.065 per cent) and then gradually increasing the concentration, a considerable degree of tolerance, similar to that produced by low oxygen pressure in inspired air, was established. Campbell's experiments proved that the heart muscle does not tolerate a low oxygen tension and that as a result circulatory failure develops, with congestion, edema, degeneration and atrophy. The greatest changes from congestion occurred in the liver, lungs, heart muscle and brain.

The pathologic changes caused by carbon monoxide poisoning affect primarily the vascular system (Litzner [7]). There are marked dilatation of the peripheral vessels, slowing of the blood stream, increased permeability of the vessel walls with hemorrhage, perivascular infiltration and edema. Chornyak and Sayers [8] observed in dogs asphyxiated with carbon monoxide small petechial hemorrhages, most of them not larger than would be caused by diapedesis through the dilated vessels. These small punctiform hemorrhages are characteristic lesions and may occur in any organ in the body. Larger hemorrhages also occur. Fatal cases of epistaxis and hemoptysis have been reported, and cases of bleeding from the stomach, intestine and kidneys have been observed clinically. In consequence of the vascular changes incurred through impaired nutrition, arterial spasm, thrombosis and gangrene may develop. Kroetz [9] stated that the classic anoxemic lesions in the heart of victims of carbon monoxide are hemorrhage, necrosis and processes of granulation and regeneration and that their coexistence with similar lesions in the brain adds to their significance. The lesions undergo rapid regenerative changes, and the processes of repair may be fully developed by the ninth day. He inferred that the condition may be in the nature of toxic myocarditis with symptoms of cardiac dilatation, lowering of blood pressure and alteration in the cardiac sounds, rate and rhythm. Patients with mild involvement often recover promptly, as is indicated by the clinical course and electrocardiographic studies. Patients with severe involvement ultimately die a cardiac death.

The lesions affecting the heart have certain well defined areas of predilection. These are in the papillary muscles of the mitral valves and in the wall of the left ventricle. In nine patients examined post mortem by Gey,[10] definite macroscopic hemorrhages were observed in the apex of the papillary muscles of the mitral valve, and he expressed the opinion that such hemorrhages account for the dilatation of the left ventricle usually observed at autopsy. The acute dilatation he attributed to atony of the heart muscle. When the dilatation persists over a longer period it implies damage to the heart muscle through hemorrhage and necrosis. The nutritional changes resulting from these lesions not only affect the heart muscle but may affect the bundle of His, as has been demonstrated by Lewis, White and Meakins,[11] who observed auriculoventricular block in cats poisoned by carbon monoxide. Greene and Gilbert [12] by oxygen deprivation produced in man diminished conductivity of the auriculoventricular nodes as well as of the bundle of His. Haggard [13] was able to demonstrate in dogs auriculoventricular dissociation and even complete block, but the latter did not occur until increased anoxemia developed through respiratory failure. By stimulating respiration and promoting elimination of carbon monoxide by inhalation of carbon dioxide and oxygen, conduction was restored to normal.

Colvin [14] observed a chauffeur poisoned by automobile exhaust gas who at the onset had pulsus alternans, with a rate of 140 a minute. Twenty-six hours later he had sinus arrhythmia and intraventricular block. Two days later the left branch of the bundle of His was involved. In five days the condition had entirely cleared. When the injury to the myocardium persists over a long time it causes a permanent disability (Holm [15]).

In patients with carbon monoxide anoxemia, thrombi commonly occur in the small vessels; larger vessels are not exempt, however, as many cases of coronary thrombosis have been reported. Nagel [16] reported two cases of coronary disease from carbon monoxide gas and cited eight cases reported by Kroetz. Wachholz [17] observed changes in the myocardium, with a fall in blood pressure, stasis, thrombus formation and occlusion of a branch of the coronary artery. The pathologic changes observed by Kaufmann [18] in a man aged 35 who died from an embolism in a healthy left coronary artery were dilatation of the left ventricle and pulmonary edema. Zondek,[19] by means of roentgen examination, visualized cardiac dilatation in rabbits

4. Allbutt, Sir Clifford: Diseases of the Arteries, Including Angina Pectoris, ed. 1, New York, Macmillan Company, 1915, vol. 2, p. 374.
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6. Nasmith, G. G., and Graham, D. A. L.: The Hematology of Carbon Monoxide Poisoning, J. Physiol. **35**: 32-52, 1906-1907.
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13. Haggard, H. W.: Studies in Carbon Monoxide Asphyxia, Am. J. Physiol. **56**: 390-403 (July) 1921.
14. Colvin, L. T.: Electrocardiographic Changes in a Case of Severe Carbon Monoxide Poisoning, Am. Heart J. **3**: 484-488 (April) 1928.
15. Holm, Kurt: Acute and Chronic Carbon Monoxide Poisoning, Med. Welt **7**: 191 (Feb. 11) 1933.
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17. Wachholz, L.: Zur Kohlen Noxyvergiftung, Vrtljschr. f. gerichtl. Med. **31**: 12, 1906.
18. Kaufmann, Edward: Pathology for Students and Practitioners, Philadelphia, P. Blakiston's Son & Co., 1929, vol. 1, p. 57.
19. Zondek, H.: Herzbefunde bei Leuchtgasvergiftung, Deutsche med. Wchnschr. **46**: 235 (Feb. 26) 1920.

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acutely poisoned by carbon monoxide. In cases of acute poisoning by coal gas the heart may rupture. Pulvertaft [20] reported the case of a girl of 19 who committed suicide by putting her head in a gas oven. Although the right ventricle had ruptured, microscopic sections revealed a normal heart and coronary vessels.

Investigation on the pathogenesis of angina pectoris by Christ [21] showed that it results as a rule from acute coronary insufficiency and that, as a feature of the disease, disseminated ischemic necrosis not infrequently develops. Similar necrotic changes have been produced experimentally in animals by Büchner.[22] Even mild exposure to carbon monoxide caused such lesions in rabbits. In both man and animals Dietrich and Schwiegk [23] caused acute coronary insufficiency through deprivation of oxygen.

On the basis of these observations and numerous others not mentioned, we feel convinced that carbon monoxide has an important etiologic role in the development of myocardial lesions after asphyxiation with carbon monoxide in patients with no history of preexisting heart disease.

REPORT OF CASES

Our personal observations are based on the study of a series of 136 cases of chronic carbon monoxide anoxemia extending over a period of fifteen years. The symptomatic manifestations and clinical syndromes have been described in previous publications.[24] The chief complaints of many of the patients were referable to the cardiovascular system. The most outstanding symptoms were palpitation, dyspnea, irregular heart action and precordial distress. The following cases, selected from this group, serve to emphasize the importance of carbon monoxide as an etiologic factor:

CASE 1.—G. D., a farmer and cattle dealer of West Virginia, aged 36, referred by Dr. Jones and Dr. Woodyard, presented a history of coronary thrombosis, heart block and symptoms of chronic encephalitis, with the parkinsonian syndrome.

The mother had died of angina pectoris and the father of paralysis agitans. The patient's past history was not significant. His health had been good until February 1935, when an attack diagnosed as influenza suddenly developed and he had a temperature from 103 to 104 F. He was admitted to the hospital, where a diagnosis of coronary thrombosis was made. After six weeks he returned home. In June, after extraction of his teeth, he had heart block, with a pulse rate of 30 a minute and typical attacks of the Adams-Stokes syndrome. He slowly recovered from these attacks but continued to be extremely nervous, emotional and obsessed with fear. On admission to the clinic Sept. 25, 1935, he was highly emotional and introspective, exhibiting intense fear when alone. He was considerably overweight and presented the typical parkinsonian syndrome, with masklike expression, flushed face, dry and desquamating skin, tense and rigid muscles and inability to feed himself, sit erect or stand and walk unaided. His speech was slow, hesitating and monotonous, and he had difficulty in finding words to express himself. The blood pressure was 132 systolic and 92 diastolic. The cardiac measurements were normal. There were an occasional extrasystole and a soft systolic murmur at the base. There were no changes in the breast sounds. The abdominal reflexes were absent, the plantar reflexes were normal and the deep tendon reflexes were hyperactive. There were coarse tremor of the tongue and definite intention tremor of both hands. The neurologic diagnosis, which was confirmed by Dr. Gillis, was chronic encephalitis, probably the result of carbon monoxide anoxemia.

Dr. King, who saw the patient later in consultation, stated that his heart was normal on physical examination except for extrasystoles, and the only abnormality found in the electrocardiogram was extrasystoles. Laboratory studies showed an occasional trace of sugar in the urine, a normal amount of blood sugar and of blood cholesterol and a negative Wassermann reaction. When the patient was admitted, the hemoglobin content was 100 per cent, a blood count showed 5,620,000 red cells and 13,950 white cells and the differential count was normal. The basal metabolic rate was minus 8.6 per cent.

The patient lived in the midst of a newly developed oil and gas field. The home was heated by burning unrefined wet gas from the patient's own well, both day and night, in open unventilated gas heaters. During his illness gas was escaping from an imperfect heater in his bedroom. His wife noticed the odor of gas, and the doctor, recognizing it, ordered the windows open for protection. During this period the patient was stuporous, delirious, gasping for breath and nauseated; he vomited and broke out in a cold perspiration. His wife, who occupied the same room, became ill and suffered from nervousness, dizziness and headache, and his sister, who slept in an adjoining room, was similarly affected. The patient made a remarkable recovery when he was freed from exposure to gas. The cerebral as well as the cardiac symptoms completely subsided.

CASE 2.—W. A. M., a physician, aged 74, presented himself for examination in December 1935 with a diagnosis of angina pectoris and cerebral thrombosis and a history of coronary thrombosis fourteen years before.

In the winter of 1921 he suffered an attack of severe precordial pain, in which he fell and was unconscious. This pain persisted for two weeks and required the use of morphine for five days. A diagnosis of coronary thrombosis was made. The patient recovered slowly. He remained free from cardiac symptoms until October 1935, when he began to complain of paroxysmal precordial pain of two or three hours' duration, but he was able to continue his work. He also complained of dyspnea and cough. For his precordial attacks he resorted to the use of vasodilators, which afforded relief.

He gave a history of having been exposed to carbon monoxide for a period of thirty years, during which he frequently experienced the symptoms characteristic of anoxemia. He spent on an average seven hours daily in his office, which was heated by gas stoves. In cold weather the gas burned day and night.

In March 1935 an acute attack of "influenza" developed and he was confined to bed for three weeks. This was followed by symptoms suggesting a mild form of cerebral thrombosis, with slight weakness and paresthesia in the left arm and left leg and a staggering gait. These symptoms slowly subsided.

Examination Dec. 3, 1935, showed moderate arteriosclerosis, a normal-sized heart and an occasional extrasystole but no murmur; the blood pressure was 102 systolic and 62 diastolic, the pulse rate 70 and the temperature subnormal; moist rales were heard in both bases. Urinalysis, a blood count and a Wassermann test gave negative results.

It is significant that during the summer months of 1935 he had no attacks of angina pectoris, while during the following winter months he had frequent attacks. In the fall, when he began burning gas in his office, the attacks returned, averaging about one daily until November 11, when he motored to Florida. On this trip he had only one attack, which occurred several hours after he left his home in Clarksburg; but on his return two weeks later they recurred. However, since December 1936, when the fuel for heating his office was changed from gas to coal, he has been absolutely free from attacks.

COMMENT

These two patients suffered not only from the effects of carbon monoxide anoxemia on the heart but from its effect on the central nervous system. In case 1

20. Pulvertaft, R. J. V.: Rupture of the Heart in Coal Gas Poisoning, Lancet **2**: 280-290 (Aug. 6) 1932.
21. Christ, Curt: Experimentelle Kohlenoxydvergiftung Herzmuskelnekrosen und Elektrokardiogramm, Beitr. z. path. Anat. u. z. allg. Path **94**: 111-125, 1934.
22. Büchner, Franz: Die Rolle des Herzmuskels bei der Angina Pectoris, Beitr. z. path. Anat. u. z. allg. Path. **89**: 644, 1932.
23. Dietrich, S., and Schwiegk, H.: Das Schmerzproblem der Angina pectoris, Klin. Wchnschr. **12**: 135 (Jan. 28) 1933.
24. Beck, H. G.: The Clinical Manifestations of Chronic Carbon Monoxide Poisoning, Ann. Clin. Med. **5**: 1088-1096 (June) 1927; Slow Carbon Monoxide Asphyxiation: A Neglected Clinical Problem, J. A. M. A. **107**: 1025-1029 (Sept. 26) 1936; Chronic Carbon Monoxide Anoxemia: Clinical Syndromes, South M. J. **30**: 824-829 (Aug.) 1937.

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there were typical symptoms of encephalitis, with the parkinsonian syndrome, and in case 2, symptoms of cerebral thrombosis. Anoxemic lesions are found more frequently in the brain than in the heart, but they may occur in the two organs in the same patient, as in the cases cited; Liebmann [25] reported the case of a woman who died of poisoning by illuminating gas in whom the autopsy revealed multiple cerebral hemorrhages and severe interstitial and parenchymatous myocarditis in the wall of the left ventricle. The cerebral symptoms when pronounced may so completely overshadow the cardiovascular symptoms as to make the diagnosis difficult.

The electrocardiographic studies in case 1 may seem to have been disappointing, as they failed to show any abnormality after the clinical manifestations of both coronary thrombosis and heart block had disappeared. Records show that, in most instances of asphyxiation with carbon monoxide followed by coronary thrombosis, the electrocardiogram becomes normal as soon as the process subsides; and Haggard succeeded in restoring cardiac conduction to normal in dogs after the development of block associated with severe anoxemia.

In case 1 the red cell count of 5,620,000 was significant. A count of 5,000,000 or over occurred in 45 per cent of our cases in which the count was tabulated. Particularly noteworthy in case 1 is the history of angina pectoris in the mother and paralysis agitans in the father, two diseases not infrequently encountered in association with chronic carbon monoxide poisoning. The father and mother lived in the same community as the patient and under similar circumstances; they burned natural gas in open unvented heaters for twenty years.

CASE 3.—B. C. K., a lawyer aged 59, a resident of Oklahoma, referred by Dr. M. L. Lewis, had suffered for two years prior to admission from frequent attacks of precordial distress, clinically diagnosed as angina pectoris.

Although for several years the patient had had only occasional attacks of angina pectoris, in the late fall of 1934 they increased in frequency, averaging one daily until Jan. 10, 1935, when he went to Dallas for consultation. From there he came to Baltimore for further study and observation. During this period he did not have a single attack nor did he have any while under our observation, a period of two weeks. On examination Feb. 6, 1935, he was unable to recollect having had a single attack during the summer months when not exposed to carbon monoxide. This fact led to the assumption that carbon monoxide was a factor in the production of his anginal attacks. Further inquiry revealed a history of exposure to carbon monoxide over a period of twenty-five years. His house was heated by natural gas in open heaters, inadequately ventilated. For the previous five years he had been exposed also in the gas and oil fields; besides, he frequently detected escaping gas in his automobile while driving with the windows closed.

In addition to anginal attacks, he complained of symptoms of anoxemia: dyspnea, palpitation, weakness in the legs, unsteady gait, cramps in the calf muscles, headache, vertigo, cardiospasm and paresthesia. He used alcohol and tobacco moderately, drank coffee to excess and overworked.

His blood pressure was 102 systolic and 80 diastolic, his pulse rate 66 and his temperature subnormal. The heart was slightly enlarged, with an occasional dropped beat and reduplication of the second sound. No murmurs were heard. The blood vessels appeared normal for a man of his age.

Laboratory studies showed mild glycosuria, a blood sugar content of 174 mg. per hundred cubic centimeters, a basal metabolic rate of minus 21 per cent and a negative Wassermann reaction. A blood count showed hemoglobin content 81 per cent, red cells 4,780,000 and white cells 8,250.

Electrocardiographic study by Dr. King revealed an abnormal tracing suggestive of myocardial degeneration, possibly of coronary origin. The diagnosis of angina pectoris was confirmed by Dr. L. F. Barker.

By improving the heating conditions and adopting a more hygienic mode of living, the patient improved and remained free from anginal attacks for some months. He later had symptoms of myocardial degeneration with congestive heart failure.

CASE 4.—F. B., a man aged 60, a toll bridge executive and a resident of Pennsylvania, referred by Dr. Richard Miller, had had symptoms of carbon monoxide anoxemia for several years, and signs and symptoms of myocardial disease had recently developed.

Since November 1932 the patient had worked about seven hours daily in an office on a toll bridge, over which an average of 18,000 automobiles passed daily. Each motorist paused to pay the toll, thus exposing the employees to an enormous amount of carbon monoxide coming from the exhaust. A blood test made while the patient was on duty showed a carbon monoxide saturation of 27 per cent. A test made of the blood of five employees showed a carbon monoxide saturation ranging from 5 to 30.75 per cent, according to the length of time exposed. At the time of his first examination the patient manifested all the symptoms of severe anoxemia but the heart showed nothing abnormal.

Laboratory studies gave normal results, except that the basal metabolic rate was minus 23 per cent and the blood cholesterol content 92 mg. per hundred cubic centimeters.

Continuing to work in this environment, he later had symptoms of congestive heart failure, with dyspnea, palpitation, attacks of acute precordial pain of anginal character and extrasystoles. An electrocardiogram made June 25, 1937, showed auricular fibrillation. One made two months previously was perfectly normal. Periodic vacations of several weeks at the seashore always relieved his symptoms. On a recent examination the heart again appeared normal.

CASE 5.—S. C., a man aged 55, owner of a gas well, complained of acute precordial pain, with dyspnea and irregular heart action on exertion.

Seven years previously he had become conscious of a rapid and labored heart action on exertion, with a rate occasionally as high as 120 a minute. Two years previously his heart had begun to miss beats and at the same time he began to have anginal attacks, but only on exertion, as on going up hill.

The blood pressure was 122 systolic and 70 diastolic and the pulse rate 78 a minute. The peripheral vessels were slightly tortuous but not beaded. The heart was not enlarged and the sounds appeared normal.

The patient heated his house with nine open gas heaters, in which he burned the wet, unrefined gas. Tests made for carbon monoxide in the living and the dining room showed that the air contained enough gas to cause symptoms. After he was freed from exposure to carbon monoxide by the installation of a central heating plant he was relieved of his symptoms, including the anginal attacks.

Numerous other cases showing the relation of carbon monoxide to myocardial disease could be cited from our records.

In the majority of fatal cases the patient dies of acute asphyxiation, usually without regaining consciousness. In others the patient not only regains consciousness but apparently recovers from the acute symptoms and remains well for a few days, and then secondary manifestations suddenly appear. These manifestations are generally referable to lesions of the heart or of the central nervous system, to which the patient succumbs.

The chronic form of carbon monoxide anoxemia is represented by patients who survive the delayed effect, or sequelae, of the acute form. The cases reported

25. Liebmann, E.: Ein Fall von Herzmuskelentzündung nach Leuchtgasvergiftung, Deutsche med. Wchnschr. **45**: 1192, 1919.

were of this form, with residual cardiac symptoms. If the cause can be removed so that the patient is no longer exposed to the damaging effect of the gas, some patients will recover, symptomatically at least. This has been demonstrated by the electrocardiogram, which showed in many instances that conduction was restored to normal. The condition of other patients will progress into the chronic invalid type of myocardial degeneration, terminating in congestive heart failure and death.

Carbon monoxide as a causative agent in producing myocardial disease may help to explain the seasonal incidence of coronary thrombosis, to which Wood and Hedley [26] called attention. They reported ninety-five cases observed in Philadelphia during the autumn and winter and only fourteen in the spring and summer. Master, Dack and Jaffe [27] observed that of 612 attacks 12.2 per cent occurred in January and 10.3 per cent in December. The increased combustion of carbon monoxide-producing fuel for motor power and heating and the increased danger from automobile exhaust gas and from improper ventilation during the cold months materially increased the hazard, thus rendering more persons susceptible to cardiovascular disease, including angina pectoris, coronary thrombosis, heart block and myocardial insufficiency.

SUMMARY

1. In a group of 136 persons who had been intermittently exposed to carbon monoxide over varying periods, myocardial symptoms were frequently manifested.

2. The lesions affecting the heart, brain and other organs are primarily vascular, consisting of small hemorrhages and perivascular infiltration with focal necrosis. When the heart is affected, coronary thrombosis frequently develops, as ascertained by postmortem and electrocardiographic studies.

3. Hemorrhagic lesions affecting the heart muscle have been produced experimentally in animals subjected to varying amounts of carbon monoxide in inspired air.

4. The impression that unless the patient dies in acute asphyxiation no harm may result is erroneous.

5. Patients who apparently recover from acute asphyxiation frequently have later manifestations, which appear in from three to seven days. These are known as delayed symptoms, or sequelae, and may affect the heart, brain or other organs and terminate fatally.

6. Those who survive the delayed manifestations may completely recover or ultimately may have severe organic disease of the heart or of other organs, to which they finally succumb.

7. Lesions may occur simultaneously in the heart and the brain, as evidenced by clinical studies and postmortem observations.

8. In order to make a positive diagnosis of chronic myocardial disease resulting from carbon monoxide, it is essential that an accurate history be obtained with respect to exposure to gas, exhibition of symptoms of anoxemia, clinical course of the disease and absence of preexisting cardiac lesions.

St. Paul and Twenty-Third streets.

26. Wood, F. C., and Hedley, O. F.: The Seasonal Incidence of Acute Coronary Occlusion in Philadelphia, M. Clin. North America **19:** 151 (July) 1935. Campbell.[5]

27. Master, A. M.; Dack, Simon, and Jaffe, H. L.: Factors and Events Associated with Onset of Coronary Artery Thrombosis, J. A. M. A. **109:** 546-549 (Aug. 21) 1937.

ABDOMINAL MANIFESTATIONS OF THE HYPERACTIVE CAROTID SINUS REFLEX

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Abdominal manifestations of the hyperactive carotid sinus reflex appear to be uncommon. The manifestations to be described in this paper consisted of abdominal cramps and diarrhea, occurring in conjunction with other symptoms of severe autonomic disturbance and with syncope.

A brief sketch of the basic facts pertaining to the carotid sinus reflex is essential to an understanding of the subject. For detailed accounts of the problem one must consult the work of Waller,[1] Czermak,[2] Hering,[3] Heymans,[4] Roskam,[5] Weiss and Baker,[6] Braeucker,[7] Ferris, Capps and Weiss,[8] Smith and Moersch [9] and Åsk-Upmark.[10] The recent paper of Weiss, Capps, Ferris and Munro [11] offers a concise and lucid account to which the reader is referred. Ability to recognize these cases clinically is due primarily to the work of Weiss and his associates.

The carotid sinus is the bulbous dilatation of the internal carotid artery at its origin. It is richly supplied with a plexus of nerve fibers which give rise to the carotid sinus reflex. The reflex can be sensitized by digitalis, inhibited in certain cases by atropine and sympathomimetic drugs, and abolished by extirpation of the plexus. The chief afferent pathways are through the intercarotid, glossopharyngeal, hypoglossal and vagus nerves and the cervical portion of the sympathetic chain. The stimuli traverse central synapses in the brain stem and innervate contralateral autonomic pathways, both central and peripheral, in a variable manner. It is these variants in the efferent paths that produce the different types of motor response resulting in convulsions and syncope.

These type responses have been classified by Weiss and his associates as vagal, depressor and cerebral. The vagal and depressor types are associated with decreased cerebral blood flow and cerebral anoxemia. The vagal reaction is associated with cardiac slowing or asystole and can be modified with atropine (by depression or paralysis of the vagi) and by ephedrine and epinephrine (by direct ventricular stimulation).

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8. Ferris, E. B., Jr.; Capps, R. B., and Weiss, Soma: Carotid Sinus Syncope and Its Bearing on the Mechanism of the Unconscious State and Convulsions: A Study of Thirty-Two Additional Cases, Medicine **14:** 377 (Dec.) 1935.

9. Smith, H. L., and Moersch, F. P.: (*a*) Syncope of Patients with Hypersensitive Carotid Reflexes: Attacks Reproduced by Cardiac Standstill Induced by Pressure on Carotid Sinus, Proc. Staff Meet., Mayo Clin. **10:** 401 (June 26) 1935; (*b*) Further Study on the Hypersensitive Carotid Sinus Reflex Syndrome: Report of Thirty-One Additional Cases, ibid. **11:** 380 (June 10) 1936.

10. Åsk-Upmark, Erik: The Carotid Sinus and the Cerebral Circulation: Anatomical, Experimental and Clinical Investigation, Including Some Observations on the Rete Mirabile Caroticum, Acta psychiat. et neurol., supp. 6, pp. 1-374, 1935.

11. Weiss, Soma; Capps, R. B.; Ferris, E. B., and Munro, Donald: Syncope and Convulsions Due to a Hyperactive Carotid Sinus Reflex, Arch. Int. Med. **58:** 407 (Sept.) 1936.

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The depressor type is associated with symptoms due to reflex vasodilatation by way of the aortic depressor nerves and is modified by ephedrine and epinephrine but not by atropine. The cerebral type is not associated with decreased cerebral blood flow and the symptoms are probably due to a reaction in the vegetative centers of the hypothalamus, either directly or through the mediation of small vessels. Frequently combined vagal-cerebral and depressor-cerebral syndromes are observed. The commoner associated symptoms in order of frequency are dizziness and weakness, hyperpnea, facial pallor, bradycardia, numbness and tingling of the extremities, convulsions, drowsiness, cataplexy, epigastric distress, nausea, lacrimation, cough, amnesia and palpitation.[10]

It should be stated that the carotid sinus is but one of a number of vasosensory areas. It is not unlikely that others play a role in some disorders of analogous mechanism. The recognition of disturbances of the carotid sinus depends on the clinical accessibility of this structure. Its extirpation may abolish only one segment in a complex and widespread reflex arc, but, according to available data, this seems to be sufficient to produce the desired result in cases in which its hyperactivity has been definitely established.

The test for a sensitive carotid sinus should be carried out with some care and only one side should be stimulated at a time. The level of the bifurcation of the innominate and common carotid arteries is variable, although it is often behind the angle of the mandible. The carotid sinus is best located with the patient recumbent and the neck extended. It is then advisable to place the patient in a sitting or standing position, since the reflex is more easily evoked in this way. Several observations of the pulse and blood pressure are obtained until a base line is determined. Then pressure and massage of the sinus are carried out for from five to thirty seconds. Marked fall in blood pressure, slowing of the heart rate and general symptoms are evidences of a sensitive carotid sinus. Sudden loss of consciousness without alteration in the heart rate or arterial tension may also be indicative of hyperactivity of the carotid sinus reflex. It is extremely important to determine which of the two sinuses is the more sensitive, particularly in cases in which surgical intervention is contemplated. To exclude psychogenic factors the carotid sinus region is anesthetized with 1 per cent procaine hydrochloride; this procedure fails to abolish only those reactions which are psychogenic in origin. Stimulation of the carotid sinus has no effect in cases of narcolepsy, catalepsy, petit mal and grand mal.

After the diagnosis and classification have been established, medical therapy may be undertaken. For the vagal type of reflex atropine, ephedrine, epinephrine and benzedrine [12] are used. For the depressor type only the sympathomimetic drugs are useful. For the cerebral type, general measures—correction of systemic defects, avoidance of tight collars, fatigue and emotional upsets—are attempted. If medical therapy fails, surgical denervation of the sensitive sinus should be carried out unless some contraindication, such as local aneurysmal dilatation or sclerotic thinning, is present. The local presence of a mass, such as a tumor of the carotid body or a group of calcified nodes, of course constitutes a surgical indication. The operation consists in exposure of the carotid artery in the neck, careful stripping of the outer coat of the main arterial trunks for 2.5 cm. below and above the bifurcation and removal of the tissue—including the carotid body—between the internal and external carotid arteries.

12. Robinson, L. G.: Benzedrine Sulfate in the Treatment of Syncope Due to a Hyperactive Carotid Sinus Reflex, New England J. Med. **217**: 952 (Dec. 9) 1937.

REPORT OF CASE

A man, aged 41, presented himself for examination Sept. 23, 1936. There was no familial history of any paroxsymal nervous disorder. At the age of 17 the patient was treated for pulmonary tuberculosis, which was subsequently stated to be healed.

The first of the attacks occurred in 1928 when he was 33. At that time, while crossing a street, he suddenly and unexpectedly experienced a sensation of tightness and fulness in the head. He became confused and noted sweating and drawing sensations in the hands. His face became flushed and he complained of throbbing in the head. He then lost consciousness, fell on the sidewalk and became incontinent of feces.

Attacks followed at the rate of from one to three a year. They were preceded by a brief aura of about five minutes' duration. The patient had never sustained any injury during an attack, and there were no known convulsions. It was not possible to determine with any accuracy the duration of the periods of unconsciousness. After a severe attack he would feel weak for two or three days.

Two physicians who had been summoned to give emergency treatment reported that during the attacks the pulse was very slow and irregular.

Rather intensive questioning failed to disclose any important psychogenic background. There was no history of constriction of the neck, as with a tight collar or pressure of the hand, preceding any of the attacks.

Sept. 20, 1936, at 7:30 p. m., the patient had another attack, which will be described in detail. Without antecedent nervousness, insomnia, constipation or ingestion of alcohol he experienced cramps in the lower part of the abdomen followed by an apparently normal bowel evacuation. On leaving the bathroom he noted a sensation of "blood rushing to the head" and his head seemed to "swell up like a balloon." While he was walking to his bedroom his fingers and toes began to tingle and sweat. He felt "uncertain and dizzy." His face was red but not blue; there was no foaming at the mouth. On reaching the bedroom he again experienced cramps in the lower part of the abdomen and attempted to return to the bathroom, where he fell unconscious into the tub, had a loose bowel movement and urinated. He was unconscious for from half an hour to an hour. There was no injury or biting of the tongue. A physician was summoned, who administered two hypodermic injections. At about 9 o'clock the patient regained consciousness, felt weak and stumbled into bed.

Physical examination September 23 was essentially negative. Neurologic and retinal examinations were likewise negative. The blood pressure was 120 systolic, 80 diastolic. X-ray examination of the skull showed no abnormality in the vault or sella. Radiographic examination of the chest showed small calcified and fibrotic deposits in both apical regions of the lungs, more marked on the left; there were old adhesions elevating the midportion of the left diaphragm. The basal metabolic rate was plus 9 per cent. The urine showed no abnormality. The blood count showed hemoglobin 106 per cent, red blood cells 6,380,000 per cubic millimeter and white blood cells 9,900, of which the polymorphonuclear neutrophils constituted 55 per cent, lymphocytes 39 per cent, eosinophils 5 per cent, basophils 1 per cent. The urea nitrogen content of the blood was 22.4 mg. per hundred cubic centimeters, sugar 100. The blood Wassermann and Kline reactions were negative. A routine electrocardiogram showed left axis deviation. With the patient holding a deep inspiration, the axis deviation was abolished, the R wave in lead 3 becoming large and the S wave small; a striking fall in pulse rate was noted.

The patient was seen by Dr. Israel Strauss, who expressed the opinion that idiopathic epilepsy and brain tumor could be excluded. During a subsequent joint observation, studies of the carotid sinus reflexes were made. Pressure on the right sinus produced a fall in blood pressure from 110-120 systolic and 70-80 diastolic to 80-90 systolic and 60 diastolic. The pulse rate fell from 84 to 60 beats per minute. In addition

there were induced well marked symptoms such as the patient had experienced during the early stage of an attack: sensation of fulness in the head, tendency to labored breathing, numbness and sweating of the hands, tendency to unconsciousness. Even after stimulation for from twelve to fourteen seconds, however, unconsciousness and convulsions were not induced. Pressure on the left carotid sinus produced a similar fall in blood pressure and slight bradycardia but no abnormal subjective effects. The patient was instructed to take phenobarbital and atropine and to carry with him readily soluble tablets of atropine (1/100 grain, or 0.0006 Gm.) to take when a severe attack impended.

In December the patient had a severe attack, which he believed was somewhat modified by the use of atropine. From this time until the end of May 1937 he had two milder episodes without loss of consciousness.

May 26, at midnight, the patient entered his car to drive home. Nothing remarkable had occurred during the earlier part of the evening; he had taken one glass of beer. After driving for a few minutes through a congested district he "felt an attack coming on." The preliminary symptoms were those already noted in the description of the attack of September 1936. He took one tablet of atropine and stopped his car. He then attempted to leave his car to defecate. At this point he lost consciousness. At 3:30 a. m. he was seen by an ambulance surgeon and at 4 o'clock I saw him. He had regained consciousness but complained of pain in the back of the neck, of intense fatigue and of headache. He again stated that his head felt "like a balloon."

On examination the face was flushed. The patient was fully conscious but slightly drowsy. There was no pain on movement of the neck, and no meningeal signs. The lower part of the back and the buttocks were soiled with feces. The blood pressure was 130 systolic, 90 diastolic. The pulse rate was 84 beats per minute, pounding in quality. The pupils were equal in size and were not dilated; the left pupil reacted more sharply to light than the right. The mouth was dry (the patient had taken atropine). The knee and ankle reflexes on the left were somewhat more brisk than on the right. There was a neutral plantar response on the right; the response on the left was normal.

Six hours later the patient appeared fully recovered. The blood pressure was 110 systolic, 80 diastolic. The pulse was from 76 to 80 beats per minute. A sense of fatigue was present which cleared up in the course of the next three days.

June 6, 1937, the patient was seen by Dr. Soma Weiss, who confirmed the observations of the carotid sinus reflexes previously recorded. Procainization of the right carotid sinus abolished its reflexes. The surgical indications were analyzed as follows: 1. Medical therapy with atropine, phenobarbital and, later, ephedrine had been essentially unsuccessful. 2. The velocity of evolution of the severe attacks precluded successful self medication with atropine. 3. There was obvious inherent danger in some of these sudden attacks, such as the one recorded in which the patient was driving an automobile.

Consequently, surgical denervation of the right carotid sinus was carried out June 17 by Dr. Donald Munro at the Boston City Hospital. No gross pathologic changes were encountered. Recovery was uneventful. No subsequent attacks have occurred. Four months and six months after operation pressure over the right carotid sinus region produced no symptoms and no fall in blood pressure or pulse rate.

COMMENT

The interesting features of this case may be outlined briefly. There was nothing in the history to point to the carotid sinus as the origin of the widespread autonomic disturbances. However, in only approximately 25 per cent of cases is an important lead obtained in the anamnesis.[9a] The avoidance of constriction of the neck by the use of loose collars is sometimes observed. Disturbances of the bowel such as occurred in this case are due, as has already been indicated, to severe widespread autonomic discharge with the afferent limb of the reflex arc in the carotid sinus. They are relatively unusual and may further confuse the differential diagnosis between hyperactive carotid sinus reflexes and idiopathic epilepsy. It is not unlikely, however, that with more general recognition of these disorders more cases of this type will be observed. Of interest was the prolonged duration of the attacks of syncope noted in this case, since ordinarily these are of relatively short duration, usually lasting only a few minutes.

Further intensive study of this and related conditions is of great importance, since it opens to improved clinical approach the field of frank and borderline autonomic and vegetative disorders.

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CONCENTRATED STREPTOCOCCUS (HEMOLYTIC) ANTITOXIC SERUM IN PUERPERAL FEVER

FURTHER THERAPEUTIC STUDIES

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Many years passed between the time that Pasteur (1878)[1] first cultivated the hemolytic streptococcus from a patient with puerperal sepsis and the time that attempts were made to combat the disease with serum. Of all the bacteria that may produce puerperal sepsis, the hemolytic streptococcus has been found the most common invader in the fatal types of the infection. Since 1895, when Marmorek[2] produced a serum which was supposedly valuable in the treatment of all types of streptococcic infections, other investigators[3] employed polyvalent serums with discouraging results. Of all the types of serum therapy for puerperal sepsis subsequently reported,[4] the most promising employed human convalescent serum.[4b] However, the inadequacy of the supply made this mode of therapy impracticable.

The Dicks[5] demonstrated the importance of streptococcus antitoxin in the treatment of scarlet fever by a controlled therapeutic study. In one series of patients with moderately severe attacks (thirty-five controls and twenty-one treated), there were no deaths, but a higher incidence of complications occurred among the controls, or untreated patients. In another series of patients with severe attacks (fifteen controls and twenty-nine treated), there was a mortality of 20 per cent in the control group and of only 3.4 per cent in the treated group.

The demonstration in 1925 of the production of toxin by hemolytic streptococci from patients with puerperal sepsis[6] and the subsequent production of an antitoxin[7] introduced a new and rational basis for serum therapy

Eli Lilly & Co. prepared the serum and furnished the author with an adequate supply for this study.

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2. Marmorek: Ann. Inst. Pasteur. **9**: 593, 1895.
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Bar and Tissier: L'Obst. **1**: 97, 1896.
4. (*a*) Krongold-Vinaver, S.: Bull. Soc. d'obst. et de gynec. de Paris, **10**: 36, 1921. (*b*) Zangemeister, W., and Meissl, T.: Wien. klin. Wchnschr. **22**: 10-14, 1909. (*c*) Bailey, Harold: Am. J. Obst. & Gynec. **7**: 638 (June) 1924.
5. Dick, G. F., and Dick, Gladys Henry: Therapeutic Results with Concentrated Scarlet Fever Antitoxin, J. A. M. A. **84**: 803 (March 14) 1925.
6. Lash, A. F., and Kaplan, Bertha: Puerperal Fever, J. A. M. A. **84**: 1991 (June 27) 1925.
7. Lash, A. F., and Kaplan, Bertha: Puerperal Fever: J. A. M. A. **86**: 1197 (April 17) 1926.

for puerperal sepsis. Subsequent clinical studies of the effect of the antitoxic serum on puerperal sepsis indicated its therapeutic value in the early stages.[8] The contemporary studies of Warnekros, Louros and Becker[9] and Gaessler[10] corroborated the definitely favorable effect of treatment with antitoxic serum. That the serum was of value only when used early in the course of the disease was in accord with the experience with serum therapy for any toxin-produced disease, such as diphtheria, infection with Bacillus welchii, scarlet fever and erysipelas. Although an advance was made over the old antistreptococcus nonantitoxic serum, the therapeutic evaluation of the preparation was very difficult because of known spontaneous recoveries from streptococcic infections and the absence of any published studies checked by adequate controls. The present study, begun in 1928, was undertaken to check the value of serum therapy in a series of patients with puerperal sepsis in which alternate patients were treated with serum.

TABLE 1.—*Predisposing Etiologic Factors in Puerperal Sepsis*

	Treated Group (40)	Control Group (33)
Race		
White	21	11
Negro	19	22
Age		
20	13	11
21-25	13	8
26-30	7	8
31-35	5	4
36-40	1	2
41	1	0
Gravida		
I	21	15
II	4	5
III	5	5
IV	1	3
V	3	1
VI	4	1
VII	1	0
VIII	0	0
IX	1	2
X	0	1
Character of Labor		
Spontaneous	24	20
Operative	16	13

TABLE 2.—*Clinicopathologic Diagnosis of Puerperal Sepsis*

	Treated Group (40)	Control Group (33)
Acute metritis	29	18
With toxemia	4	4
With early peritonitis and septicemia	6	7
With early parametritis	1	4
With early generalized peritonitis		

TABLE 3.—*Results of Antitoxic Streptococcus Serum Therapy*

Mortality	Complications	
40 treated patients 4 (10 per cent)	Unilateral parametritis, 3	Pyelitis, 2
33 control patients 13 (39.4 per cent)	Parametritis: Unilateral, 7; Bilateral, 2	Pyelitis, 1

PREPARATION AND DOSAGE OF SERUM

The serum was prepared by immunization of horses with the toxin and organisms isolated from the blood and cervices of women with severe puerperal sepsis due to the hemolytic streptococcus. The details have been described in another study.[8] The immune serum was utilized when a high antitoxic titer was demonstrated, as compared with scarlet fever antitoxin and after concentration. The initial dose was 40 cc. of the concentrated serum. It was given after the patient was tested and found to be free of idiosyncrasy to horse serum.

TABLE 4.—*Abstracts of Deaths in Treated Series*

Patient	Character of Delivery	Onset of Puerperal Sepsis	Clinicopathologic Diagnosis	Bacteriology: Cervix	Bacteriology: Blood	Serum Therapy	Comment
D. T., white, aged 25, P-I, G-II	Self induced abortion with catheter	3d day post abortion entered hospital; 104.2, 118, 22; chills, lower abdominal pain for 48 hours	Acute metritis; early peritonitis	Str. hem.	Neg.	5th day post abortion 40 cc. intravenously; 6th day post abortion 20 cc. intramuscularly; 7th day post abortion 40 cc. intravenously (104, 160, 44)	Died 8th day post abortion; generalized peritonitis; no autopsy
S. J., white, aged 21, P-I, G-II	Self induced abortion with catheter	5th day post abortion; pains in lower abdomen; 6th day post abortion entered hospital; 103.4, 124, 40	Acute metritis; early peritonitis	Str. hem.	Neg.	7th day post abortion 40 cc. intravenously; 8th day post abortion 40 cc. intramuscularly; 9th day post abortion 20 cc. intramuscularly	Died 12th day post abortion; autopsy: generalized peritonitis
M. M., white, aged 22, P-V, G-V	Forceps delivery at home followed by daily douches for chills, fever	6th day P.P. entered hospital; 104.4, 182, 32; toxic; abdomen slightly distended but soft	Acute metritis; early parametritis; peritonitis	Str. hem.	Str. hem.	7th day P.P. 40 cc. intravenously; 8th day P.P.; 40 cc. intramuscularly; 9th day P.P. 20 cc. intramuscularly; 10th day P.P. 20 cc. intravenously	Died 11th day P.P.; generalized peritonitis; septicemia; no autopsy
M. S., white, aged 40, P-V, G-VI	Spontaneous delivery, 6 hours 27 min. labor	2d day P.P.; 103.4, 120, 20; pain in lower abdomen	Acute metritis	Str. hem.	Neg.	8th day P.P. 60 cc. intramuscularly	Died 9th day P.P.; generalized peritonitis; no autopsy

The intravenous route was used if the patient was very toxic, but usually the intramuscular route was chosen. The same dose was repeated in twenty-four hours if the clinical course of the patient required it. A third dose of 20 cc. was given twenty-four hours later if necessary. From clinical experiences it was observed that as a rule 100 cc. of the concentrated antitoxic serum was sufficient to obtain a favorable response.

CLINICAL MATERIAL

The patients treated were all in the sepsis ward of the Cook County Hospital, having been delivered there or elsewhere. All of them had cultures taken of material from the cervix which yielded hemolytic streptococci. Cultures of the blood were also taken. In order for a patient to receive serum therapy or to be included in our series for study, the comprehensive diagnosis had to be puerperal sepsis, acute metritis, septicemia or toxemia, hemolytic streptococcus infection. Although the plan followed was to give serum to alternate patients, in compiling my statistics I found several more in the serum group, the reason being that

8. Lash, A. F.: Am. J. Obst. & Gynec. **17**: 297 (March) 1929.
9. Warnekros, K.; Louros, N., and Becker, M.: München. med. Wchnschr. **73**: 2155 (Dec. 17) 1926.
10. Gaessler, E.: München. med. Wchnschr. **75**: 164 (Jan. 27) 1928.

the inclination of the house physician occasionally was to use the serum in cases of severe involvement despite the rule. All the patients fulfilled the criteria of having early severe sepsis on the basis of clinical, pathologic and bacteriologic changes, as discussed in a previous publication on nomenclature.[11] There were forty patients in the treated group and thirty-three in the control group. Although the stage of the disease was judged early, on the basis of duration of fever and symptoms, careful examination and the clinical course demonstrated variations in the rate of the progression of the infection and resulting pathologic changes. Thus acute metritis and toxemia were usually present from three to five days after the onset of the infection, but in some instances generalized peritonitis or septicemia occurred within the same time. Therefore, the evaluation of the clinical material of puerperal sepsis was difficult, but these factors were considered in the analysis of the two groups. There were seven positive blood cultures for hemolytic streptococci in the control group and six positive blood cultures in the treated group.

TABLE 5.—*Abstracts in Deaths in Control Series*

Patient	Character of Delivery	Onset of Puerperal Sepsis	Clinico-pathologic Diagnosis	Bacteriology: Cervix	Bacteriology: Blood	Comment
K. D., Negress, aged 18, P-I, G-II	Spontaneous delivery at home	4th day P.P. 103; 124; 22, chills	Acute metritis	Str. hem.	Neg.	Died 22 days P.P.; septicemia; no autopsy
A. D., white, aged 28, P-IV, G-V	Spontaneous 5½ months miscarriage at home; placenta removed by doctor	2d day P.P. 104.4; 124; 24	Acute metritis; early parametritis; septicemia	Str. hem.	Str. hem.	Died 17 days P.P.; septicemia; no autopsy
A. S., white, aged 40, P-XIII, G-XIII	Attempted forceps, version and extraction at home; craniotomy and manual removal of placenta in hospital; spontaneous delivery	2d day P.P. 101.4; 132; 40	Acute metritis	Str. hem.	Neg.	Died 62 days P.P.; autopsy; subacute P.P. metritis; purulent parametritis; recent thrombo-endocarditis of mitral valve; thrombosis of left sigmoidal petrosal and cavernous sinus plus usual general pathologic changes of sepsis
M. J., Negress, aged 26, P-II, G-II	Spontaneous delivery	4th day P.P. 103; 124; 22	Acute metritis	Str. hem.	Neg.	Died 18 days P.P.; septicemia; no autopsy
B. S., Negress, aged 17, P-I, G-I	Spontaneous delivery; artificial rupture of B.O.W.	3d day P.P. 103.4; 124; 32	Acute metritis; early peritonitis; septicemia	Str. hem.	Str. hem.	Died 7 days P.P.; generalized peritonitis; septicemia
L. G., Negress, aged 30, P-I, G-II	Classic cesarean section	2d day P.P. 101.4, 120; 26	Acute metritis; early peritonitis	Str. hem.	Neg.	Died 5 days P.P.; autopsy: diffuse fibrinopurulent peritonitis metritis
G. B., white, aged 33, P-IV, G-V	Self induced abortion	3d day post abortion; 102.4; 124; 22	Acute metritis	Str. hem.	Neg.	Died 91 days post abortion; autopsy; suppurative thrombophlebitis of uterine, iliac, femoral veins and inferior vena cava, plus generalized appearances of septicopyemia
I. C., Negress, aged 31, P-IX, G-IX	Spontaneous delivery	4th day post partum; 102.2; 110; 16	Acute metritis	Str. hem.	Neg.	Died 14 days P.P.; autopsy: pseudomembranous suppurative endometritis metritis, thrombophlebitis left ovarian vein, right ovarian vein and inferior vena cava; multiple lung abscesses
M. G., Negress, aged 30, P-IV, G-IV	Spontaneous delivery	4th day post partum; 103; 100; 88	Acute metritis; septicemia	Str. hem.	Str. hem.	Died 31 days P.P.; septicemia
A. D., Negress, aged 16, P-I, G-II,	Self induced abortion with penholder	5th day post abortion; 102.8; 112; 24	Acute metritis; early peritonitis	Str. hem.	Neg.	Died 11 days post abortion; generalized peritonitis
T. A., Negress, aged 21, P-III, G-V	Spontaneous delivery	3d day post partum 103.2; 102; 22	Acute metritis; early peritonitis	Str. hem.	Neg.	Died 14 days P.P.; generalized peritonitis
L. T., Negress, aged 32, P-III, G-IV	Spontaneous delivery at home	4th day post partum 104.8; 126; 22	Acute metritis; septicemia	Str. hem.	Str. hem.	Died 6 days P.P.; autopsy: acute metritis, septicemia
L. S., white, aged 24, P-III, G-IV	Spontaneous delivery	2d day post partum 103.2; 128; 22	Acute metritis	Str. hem. also in throat	Str. hem.	Died 7 days P.P.; septicemia

The clinical statistics given in table 1 indicate a similar incidence of the usual etiologic factors of puerperal sepsis, particularly the high incidence of operative deliveries. Table 2 shows the incidence of the pathologic stages in the two series of patients studied when first seen. The diagnosis of early puerperal sepsis was a chronologic one; that is, a duration of from two to five days. The varying rate of progression of the infection during this interval is evident from table 2. The two groups of patients were, however, similar, allowing for the determination of the value of serum therapy.

The results of the antitoxic streptococcus serum therapy are given in table 3. The residual pathologic changes found clinically when the patients were discharged are also given. The favorable effect of the serum therapy is apparent in a comparison not only of the mortality but also of the incidence and extent of the residual pathologic changes. When the early cases of my last report were included, the total number of patients treated was sixty, with a mortality of 8 per cent (five patients), and there were forty-four control patients, with a mortality of 48 per cent (twenty-one patients); the latter rate is comparable to the mortality reported by Fitzgibbon and Bigger[12] (51 per cent in fifty-seven patients not treated with serum).

The amount of serum used depended on the clinical response. Of the forty patients, twelve received 40 cc., nine received 60 cc., six received 80 cc., six received 100 cc., five received 120 cc. and one received 160 cc. No immediate reaction followed the use of the concentrated serum. Although the intravenous injection gave a quicker therapeutic response, the intramuscular route was most often chosen for the sake of safety. The difference in rate of absorption between the two may not be great, but the effect is much more striking with intravenous administration. Late serum sickness, that is, erythema, urticaria and swollen and tender joints, occurred from six to nine days after the administration of the serum in 40 per cent of the patients, which is a high incidence. No serious consequence followed the serum sickness, except in two patients: one had persistent sciatica and the other had toxic encephalitis (no organisms on smear or culture). They recovered, and the relation to serum therapy was dubious.

An analysis of the deaths in the treated group (table 4) shows that the cause of death was generalized peritonitis. The negative value of the serum in this group was not due to the delay in the administration of

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the serum except in probably one instance (M. S.) but rather due to the rapidity of the extension of the infection (generalized peritonitis). It is again evident that serum is of no value in the treatment of this type of infection.

The deaths in the control group (table 5) may be considered as those due to early fulminant peritonitis and, in a larger group, to delayed development of peritonitis and other pathologic states. The assumption might be warranted that in the latter group the early use of serum might have prevented the progression to peritonitis and the other fatal complications (septicemia, thrombophlebitis and septicopyemia). There were no deaths from septicemia or thrombophlebitis with septicopyemia in the treated group.

Mention may be made of the procedure of sending an adequate supply of serum to ten different obstetric clinics for further clinical evaluation. The reports were incomplete and could not be used for any statistical study.

CONCLUSIONS

1. The value of antitoxic serum therapy in the treatment of early hemolytic streptococcus puerperal sepsis is demonstrated by the marked reduction in mortality and residual pathologic changes in a controlled series of cases.

2. The early diagnosis of hemolytic streptococcus puerperal sepsis is essential for the successful use of the antitoxic (hemolytic) streptococcus serum.

3. Failures despite early therapy may be due to the abnormally rapid progression of the infection (fulminant form of generalized peritonitis).

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PEPTIC ULCER IN SYPHILIS OF THE CENTRAL NERVOUS SYSTEM

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While studying a series of cases of syphilis of the central nervous system we were impressed by the number of patients who entered the hospital complaining of nausea, vomiting, hematemesis and epigastric pain. Complete study of these cases gave results which are at variance with our previous conceptions and constitute the basis for this report.

MATERIAL AND METHOD

All cases of syphilis of the central nervous system admitted to an active, large general hospital during a period of approximately four years were studied. Each case was examined by one or more of us. A few of these cases presented other primary causes for hospitalization, such as pulmonary tuberculosis. In each case complete examination facilities were utilized, so that gastric analyses and roentgenologic study of the gastrointestinal tract were accomplished in all indicated cases. All pathologic changes found on roentgen examination were verified after the administration of belladonna and atropine. Only patients in whom abnormalities were found on repeated roentgen examination and who had definite gastric symptoms were placed in the ulcer group.

All cases presented clear-cut neurologic, psychiatric and spinal fluid signs of syphilis of the central nervous system. A minimum of two examinations of the spinal fluid was made in each case included in the series. Wassermann and Kahn reactions of the blood were both obtained at least twice in each case. These serologic reactions of the blood were negative or only incompletely positive in approximately 30 per cent of our cases. Cases incompletely studied or those presenting questionable clinical conditions were excluded from the series. This accounts for an additional thirty-seven cases. Two hundred cases of syphilis of the central nervous system remained for study.

TABLE 1.—*Incidence of Peptic Ulcers in Syphilis of Central Nervous System and Control Groups*

	Syphilis of Central Nervous System	Latent Syphilis	Pulmonary Tuberculosis	Serial Admissions
Average age, years	40.8	38.9	34	35.2
Total cases	200	200	100	100
Total peptic ulcers	21	3	1	3
Incidence of peptic ulcer, per cent	10.5	1.5	1.0	3.0

The controls for our observations on these patients with syphilis of the central nervous system were three other groups of patients in the hospital during the period of study. The method of study was identical with that outlined for the neurosyphilis group. These control groups consisted of:

1. Two hundred patients with latent syphilis. Each of these patients repeatedly had completely positive blood Wassermann and Kahn reactions without any demonstrable clinical or serologic involvement of the cardiovascular or central nervous systems.

2. One hundred patients with pulmonary tuberculosis, none of whom had syphilis.

3. One hundred patients consecutively admitted to this hospital.

In addition to the basic study of 200 patients with syphilis of the central nervous system and the control groups, we studied the records of 100 patients with peptic ulcer, who had been examined and treated in the hospital, for evidence of syphilis of any type.

OBSERVATIONS

The incidence of peptic ulcer in our series of cases of syphilis of the central nervous system was 10.5 per cent, while this condition occurred in the control series in from 1 to 3 per cent of the cases, as shown in table 1.

The characteristics of peptic ulcer as we observed them in our series of patients with syphilis of the central nervous system were of interest and, we believe, of significance. The symptoms presented in this group were characteristic of ulcer of the duodenal, gastric or anastomotic areas. The roentgenologic aspects were those of peptic ulcer of these areas without reference to any underlying or accompanying systemic disease. The gastric analyses were, however, of considerable interest in that thirteen of the twenty-three patients having both syphilis of the central nervous system and peptic ulcer had repeatedly low determinations of total and

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free hydrochloric acid. These data, together with those of the related control groups, are shown in table 2.

The anatomic distribution of the peptic ulcers found in each group is presented in table 3, from which it is evident that we were dealing largely with duodenal lesions.

TABLE 2.—*Hypo-Acidity, Hyperacidity and Normal Gastric Acidity in Peptic Ulcers*

	Syphilis of Central Nervous System	Latent Syphilis	Pulmonary Tuberculosis	Serial Admissions
Peptic ulcers	21	3	1	3
Hypo-acidity	13	1	0	0
Hyperacidity	8	0	1	3
Normal gastric acidity	0	2	0	0

We observed several other phenomena of interest in our series of cases of syphilis of the central nervous system with peptic ulcer. Thus, while under observation, one patient died of perforation of the duodenal ulcer and resultant peritonitis. In four cases the duodenal ulcer ruptured while the patient was under observation and required immediate surgical intervention: three patients recovered and one died, as noted before. Three patients had hematemesis while under observation, vomiting large amounts of blood; two of these patients had tabes dorsalis and both prior to and subsequent to hematemesis presented typical symptoms of gastric crises. There were two additional cases of malignant ulceration of the gastric mucosa which were not included in the series. Diagnosis in both of these cases was verified at autopsy.

Detailed study of the results of treatment of patients with syphilis of the central nervous system and peptic ulcer will form the basis for a subsequent report.

Of the twenty-one patients in this series twelve had dementia paralytica, four had tabes dorsalis and five had syphilis of the cerebrospinal system.

The cases in the control groups were studied only as they related to syphilis of the central nervous system and peptic ulcer. Thus, in our first control group of 200 patients with latent syphilis the incidence of peptic ulcer was 1.5 per cent, as shown in table 1. In our second control group of 100 patients with pulmonary tuberculosis, all of whom had a chronic systemic disease and none of whom had syphilis, the incidence of peptic ulcer was 1 per cent. In our third control group of 100 serial admissions to the hospital, studied for the incidence of peptic ulcer in an unselected series of patients, ulcers were found in 3 per cent.

Finally we studied a group of 100 patients with peptic ulcer to determine the incidence of syphilis of the central nervous system in such a series of patients. The results are given in table 4. It will be noted that the incidence of syphilis in this group is 5 per cent, which figure is essentially the experience of the hospital over a period of several years. The incidence of neurosyphilis was 2 per cent in the ulcer group as compared to an incidence of less than 1 per cent neurosyphilis in all admissions to this hospital. The average age in this group is greater than that of any other studied and may be of significance, although we are unable to evaluate this factor from our data. As we have indicated in table 3, the anatomic distribution of peptic ulcers in this group did not vary greatly from that seen in the group with syphilis of the central nervous system and peptic ulcer.

TABLE 3.—*Anatomic Distribution of Peptic Ulcers*

	Syphilis of Central Nervous System	Latent Syphilis	Pulmonary Tuberculosis	Serial Admissions	Peptic Ulcer
Duodenal ulcers	17	3	1	3	76
Prepyloric ulcers	3	0	0	0	22
Marginal ulcers (old gastroenterostomy)	1	0	0	0	2
Total ulcers	21*	3	3	3	100

* There was in addition one case of primary adenocarcinoma of the stomach with liver metastases, verified by postmortem examination, and one case of adenocarcinoma of the head of the pancreas with secondary spread to the stomach and liver, verified by postmortem examination.

COMMENT

There is abundant evidence that peptic ulcer occurs with several systemic conditions. Thus, the works of Smith and McConkey,[1] of Hess[2] and of Magee, Anderson and McCallum[3] indicate a definite etiologic relation of scurvy and peptic ulcer. Cushing's[4] studies relating ulceration of the upper gastrointestinal tract to organic disease of the central nervous system, together with the subsequent experimental confirmatory studies of Keller, Hare and D'Armour[5] and of Watts and Fulton,[6] show the relationship of abnormalities of the central nervous system to those of the gastrointestinal tract. In the light of these last reports it would appear that the results of experimental surgical studies may well be due, at least in part, to interference with the normal nerve supply to the organs studied. This is the view of Hartzell[7] and of Beaver and Mann,[8] all of whom studied the problem by experimental surgery.

TABLE 4.—*Incidence of Syphilis in Patients with Peptic Ulcer*

Number of cases	100
Number of peptic ulcers	100
Number of cases of syphilis	5
Number of cases of syphilis of the central nervous system	2
Average age	46

When syphilis and ulceration of the gastrointestinal tract have been observed in the same patient, the usual conclusion has been that the ulceration was necessarily syphilitic in origin. Excellent studies of this problem were made by Eusterman[9] and by O'Leary,[10] each of whom concluded that the peptic ulcers they observed were actually gastric syphilis. McGlannon's[11] observations appear confirmatory of this view. While agreeing that such ulcerations were syphilitic in origin, Wile,[12] differed with Eusterman in that he was unable

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clinically or roentgenologically to differentiate syphilitic from nonsyphilitic ulcerations.

Several workers have engaged in prolonged arguments over the validity of so-called biopsy-proved cases of syphilis of the upper gastrointestinal tract. Thus Singer [13] is skeptical that McNee's [14] case is one of true syphilis of the stomach. Harris and Morgan,[15] however, appear to have definitely established the existence of syphilis of the stomach as an experimental, if not a clinical, entity. Unfortunately, some of the cases of so-called syphilis of the gastrointestinal system reported are diagnosed on questionable evidence.

We are not able, from our data, to correlate the many divergent views on the subject of involvement of the upper gastrointestinal tract by syphilis. From our data it is clear, however, that peptic ulcer occurs with significant frequency in cases of syphilis of the central nervous system. It is interesting to note that Hunt and Lisa [16] also noted the occurrence of the two conditions in the same patients but they reported their observations as clinical curiosities. Since we found no increase in the incidence of peptic ulcer in our patients with syphilis without involvement of the central nervous system, we have no justification for regarding peptic ulcers occurring in syphilitic patients as necessarily syphilitic in origin. This view is further confirmed by our failure to find an increased incidence of somatic syphilis in our patients known to have peptic ulcer.

Cushing's [4] observations suggest the possibility that syphilis of the central nervous system is an etiologic factor of significance in our cases of peptic ulcer. Instead of gastric hyperacidity, however, as would be anticipated from Cushing's nerve irritation theory, we noted gastric hypo-acidity (table 2) in a significant number of our cases. We did note gastric hypermotility in all our ulcer cases. Rivers [17] has suggested that "peptic ulcer is the result of several interacting and variable factors." Since syphilis may involve not only the central nervous system but also the vascular system, it is possible that abnormalities of both these systems played a part in the production of the peptic ulcers we found. The work of Mayo,[18] of Reeves [19] and of Wilkie [20] all show clearly the significance of vascular pathologic changes in the etiology of peptic ulcer. Among our twenty-one patients with syphilis of the central nervous system and peptic ulcer, nine also had syphilis of the cardiovascular system of such severity as to preclude treatment by fever therapy. The possibility that the role of syphilis in the production of such peptic ulcers is by involvement of the central nervous and vascular systems is interesting but is not proved by our data.

CONCLUSIONS

1. There is a greater incidence of peptic ulcer in patients with syphilis of the central nervous system than in those with latent syphilis or pulmonary tuberculosis without syphilis or in unselected hospital patients.

2. Syphilis does not appear to be of direct etiologic significance in such cases.

3. The incidence of peptic ulcer in cases of neurosyphilis in this series (10.5 per cent) is much higher than that reported from other clinics.

St. Elizabeths Hospital.

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VITAMIN D COMPLEX IN KERATOCONUS

ETIOLOGY, PATHOLOGY AND TREATMENT OF CONICAL CORNEA: PRELIMINARY REPORT

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Graves [1] describes keratoconus as "a hyperbolic bulging of the central part, or whole, of the cornea, with thinning of the center, unaccompanied by inflammation or increased tension." In a recent paper from the department of pharmacology of Columbia University College of Physicians and Surgeons, Blackberg and I [2] reported the consistent production of keratoconus in dogs fed a vitamin D deficient, low calcium diet. We have repeated these experiments on rats this past winter and have noted similar results.

In our experiments on dogs, we enucleated the eyes of some of them. These eyes were examined microscopically. The results of our pathologic examinations, corroborated by Drs. Reese and Laidlaw, have been published.[3] The basic changes in the corneas were thinning of the epithelium, edema of the substantia propria with irregularity of its lamellar structure and reduplication of the endothelium, with hydropic degeneration.

Nineteen eyes (twelve patients) with keratoconus are included in this study. One patient is presented so that the marked ectasia of the right cornea before beginning treatment may be observed. The other eleven patients have been treated for periods ranging from three months to three years. Of these eleven, seven have bilateral involvement. Four show the condition to be present in one eye and absent in the other. Of these four, three have a right keratoconus and one a left. There is a range from the slight degree of conical cornea, not readily made out, to the very marked case with perforation of the posterior layers of the membrane, epithelial cyst formation and central opacity.

Vitamin D, in the form of viosterol, and calcium, in the form of mineral mixture tablets, were prescribed.[4]

Assistance was given by Miss Diana Shrage of the New York Eye and Ear Infirmary.
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From the New York Eye and Ear Infirmary and the Montefiore Hospital, through the generosity of the attending eye surgeons of these two institutions.
Read before the New York Academy of Medicine, Section on Ophthalmology, Dec. 20, 1937, and the North Jersey Academy of Medicine, Section on Ophthalmology, May 9, 1938.

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4. Mead Johnson Company's products: Viosterol: One gram contains not less than 10,000 vitamin D units (U. S. P.); 40 drops to a gram. Mineral Mixture Tablets, No. 85: Composition: alfalfa ash 4 per cent, dicalcium phosphate 32 per cent, edible bonemeal 64 per cent; analysis: moisture 2 per cent, protein 6 per cent, fat 2 per cent, minerals (ash) 90 per cent; each tablet supplies calcium 140 mg., phosphorus 83 mg., iron, 1 mg., copper 0.05 mg., magnesium 2.8 mg., sodium 5 mg., potassium 5 mg.

Dosage of the latter varied with the milk intake. If a patient drank one quart of milk daily, one tablet was prescribed. For each glass less than this, two tablets were added. The calcium was taken before breakfast, in one dose. As a routine, sixty drops of viosterol was given daily, after the morning meal. Lately the dose has been increased to 200 drops in some cases. No other change was made in the diet or regimen.

COMMENT

All of the eleven patients treated with viosterol and mineral mixture tablets have improved subjectively and objectively. Subjectively there is improved vision. Objectively there is corresponding improvement. Refraction, macroscopic, corneal microscopic and ophthalmometric examinations were done to give an adequate index of how much progress had been made. Recently, to be more accurate, I have been using plaster-of-paris casts of the anterior segments of the eyes, before and after treatment. Six molds were made of the eyes of three patients before this therapy was started and then repeated three to six months later. Without exception the later casts showed the cones to be flatter, with less of a hyperbolic curve. With the assistance of Prof. Carlos de Zafra of the engineering department and Prof. Louis Granath of the physics department of New York University the relative height of the corneas was measured.

More detailed examination shows that in five of the six eyes—both eyes of patients 1 and 2, and the right eye of patient 3—a reduction in the height of the cone took place. The sixth—the left eye of patient 3—showed an increase. These figures may represent an underestimation of the decrease in the height of the cones, for it must be remembered that the underlying pathologic condition of keratoconus in dogs, and probably in man too, is edema of the cornea; and with the type of measurement employed, a standard base line of fixed length, a greater chord of the shrunken globe after treatment would be included in the examination. Thus it can be seen that the eye which apparently had a more pronounced protrusion after the treatment had been taken for three months, actually may have had a less prominent cone. The twelfth patient brings out this point more vividly. She has been taking viosterol and mineral mixture tablets for three years. At the onset, both interpalpebral fissures were approximately equal in the vertical meridian. She had a severe keratoconus of the right eye, with epithelial cyst formation, and a mild myopia in the left. Today there is a definite ptosis of the right upper lid. Probably this ptosis is due to a shrunken globe; for in a subsequent paper I will show, by actual measurements, that the sclera, too, may undergo shrinkage after the administration of this therapy.

CONCLUSION

A consideration of this material suggests that the calcium-phosphorus metabolism is an important factor in the development of the cornea. It would appear that the lack or deficiency of these metabolic factors would favor weakness of the membrane. This weakness then may manifest itself as a primary, noninflammatory ectasia of the cornea. The administration of vitamin D and calcium in this condition has given gratifying results. In fact, the results apparently are so encouraging that it may be we have come upon a factor or the factor in the etiology of this perplexing pathologic entity. It is true that but eleven patients (eighteen eyes) with a rare condition have been treated. Still, the regular decisive improvement of all suggests that the vitamin D complex has a definite place in the therapy of keratoconus. It is hoped that further observations along this same line will serve to give a more conclusive conception of its place in our understanding and treatment of keratoconus.

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BENZEDRINE SULFATE

ITS LIMITATIONS IN THE TREATMENT OF THE SPASTIC COLON AND A PHARMACOLOGIC STUDY OF ITS EFFECTS ON THE GASTROINTESTINAL TRACT

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Since the advent of benzedrine as a useful topical applicant to the nasal mucosa, benzedrine sulfate (benzyl methyl carbinamine sulfate [1]), by virtue of its central stimulating action, has been exhibited for the relief of so many symptoms and disorders as to become almost a panacea. Such excellent reviews of the literature have already appeared, notably by Wilbur, MacLean and Allen [2] and by the Council on Pharmacy and Chemistry of the American Medical Association [3] as well as an editorial in the *British Medical Journal* [4] that similar summaries would at this time be wholly supererogatory. Suffice it to say, benzedrine sulfate appears to be of definite value in the treatment of narcolepsy and postencephalitic parkinsonism and, only to a restricted degree in the management of certain mild depressive states and in some cases of chronic exhaustion. Although it has been reported as beneficial in the treatment of orthostatic hypotension,[5] migraine [6] and syncope due to a hyperactive carotid sinus reflex,[7] the number of patients studied have been too few to permit of any conclusions. More recently, Lesses and Myerson [8] found it helpful in the treatment of obesity.

Myerson and Ritvo [9] directed attention to the value of benzedrine sulfate in relaxing spasm of the gastrointestinal tract and pyloric sphincter. Its gastric effects

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From the Departments of Medicine, Roentgenology and Gastrointestinal Research of Michael Reese Hospital.

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included a moderate decrease in tonicity and a decrease in the emptying time; peristalsis diminished little if any, although in some cases it was increased. Hence, they advocated it as a roentgenologic aid in the differential diagnosis between functional and organic spasm. Therapeutically, they found it efficacious in the treatment of "spastic colitis" and pylorospasm. Smith and Chamberlin [10] observed a delayed emptying of the stomach and delayed motility of the small intestine and noted relaxation of spasm of the the duodenum and of the colon.

In an effort further to define its scope of usefulness, we undertook a cooperative study of its value in the treatment of the spastic colon ("unstable colon," "irritable colon") and of its pharmacologic action on the stomach, small intestine and colon.

SPASTIC COLON

Method.—Careful, detailed histories were taken and complete physical examinations, including a blood count, analysis of the urine and stool, an Ewald test meal, Wassermann and Kahn tests, cholecystograms and roentgenographic studies of the gastrointestinal tract were made in all cases. Only those patients presenting no physical abnormalities other than a spastic, irritable colon were selected for therapy. All patients with the exception of two (1 and 3) had been receiving but were refractory to the usual orthodox regimen (bland diet, atropine sulfate or belladonna, and sedation). Sedatives and antispasmodics were discontinued, and benzedrine sulfate (from 5 to 10 mg. orally) was substituted before breakfast and before lunch; in three cases an additional 10 mg. dose was taken before supper.

Results.—Of eighteen patients who were treated with benzedrine sulfate, three were improved, one noted improvement followed by a recurrence while taking the drug, eleven were unimproved, and in three the symptoms were aggravated (table 1). The results obtained were both unpredictable and varied, for in some cases improvement followed the administration of from 15 to 30 mg. daily (cases 1, 2 and 3), while in others untoward effects and exacerbations occurred after as little as 10 mg. (cases 16 and 17). Increasing the dose to as much as 30 mg. orally afforded no benefit when smaller doses were ineffective, notwithstanding the production thereby of undesirable side effects (cases 4 and 10). It is noteworthy that the patients manifesting improvement presented symptoms of lesser severity than the others and that those individuals reporting exacerbations of their symptoms possessed, in common, a more unstable, poorly integrated personality. Paradoxically, the duration of illness seemed unrelated to the therapeutic outcome.

Patient 5, unrelieved by benzedrine sulfate, subsequently responded well to the combined use of sodium bromide, bismuth subcarbonate and calcium gluconate. Patient 16, whose symptoms were intensified, noted distinct improvement when sodium bromide and atropine sulfate were substituted for benzedrine sulfate. Of interest is the diminished frequency and intensity of menopausal flushes and perspiration reported by patient 3, and relief of dysmenorrhea by patient 4.

Untoward effects, recorded by most observers and differing only in their nature, intensity and incidence, were noted in ten cases, although in three of these the effects were transitory. The more common symptoms were exhilaration, increased alertness, insomnia and dryness of the mouth and throat. The other symptoms were diverse and included marked weakness, dizziness, faintness, intense headache, tremor, palpitation, dyspnea, tachycardia, anxiety, increased irritability, numbness, pollakiuria and transitory deafness. A fine papular, erythematous rash appeared on the face, neck and upper extremities of patient 10 three and a half hours after the onset of a severe reaction to 30 mg. of benzedrine sulfate orally and was accompanied by itching and tingling of the skin; a temperature of 95.5 F. by mouth was recorded an hour and a half later. In all cases these effects subsided within twenty-four hours.

Roentgenologic Observations.—The action of benzedrine sulfate on the colon was studied roentgenographically [11] in five cases (2, 8, 9, 11 and 12). Myerson

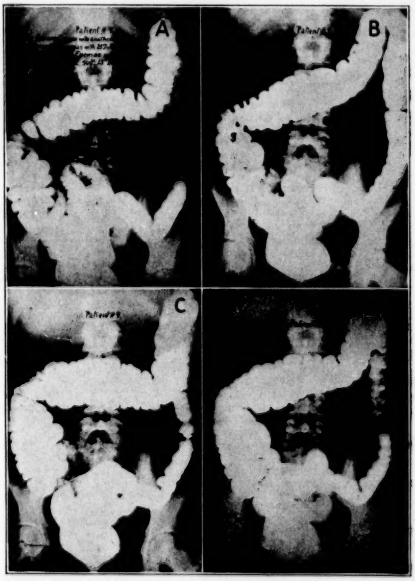

Fig. 1 (case 9).—Physiologic variations in the pattern of the colon when two successive enemas are given (*A* and *B*; *C* and *D*). The barium enema following 30 mg. of benzedrine sulfate orally (*D*) shows no greater degree of relaxation in the transverse and descending colon than the control (*B*) one day earlier. The spasm in the ascending colon and hepatic flexure in the control *B* is not present in the controls *A* and *C*.

and Ritvo [9] observed roentgenoscopically that, following the oral administration of benzedrine sulfate, in cases of spasticity of the colon, a subsequent barium sulfate enema may be given more rapidly and with less discomfort and that the lumen of the colon is increased, the haustrations are broader and shallower and the contractures and irregularities are markedly diminished, if not abolished.

It is a matter of frequent observation, however, to note such changes with a second barium sulfate enema after a period of rest and without any medication. Hence patients 8 and 9 were given a barium sulfate enema and a film of the colon was taken. Fifteen minutes after evacuation this procedure was repeated. On

10. Smith, O. N., and Chamberlin, G. W.: Benzedrine Sulfate: Its Effects on the Motor Function of the Digestive Tract, on Gastric Acidity, and on Evacuation of the Biliary System, Radiol. **29**: 676 (Dec.) 1937.

11. Drs. S. D. Mesirow and Philip Levitsky assisted in the radiographic work.

the following day, similar examinations were made, 30 mg. of benzedrine sulfate being given fifteen minutes before the second enema. In case 9 the second enema without medication (fig. 1 *B*) shows less marked and fewer haustrations and the lumen of the colon is broader than that of the preceding enema (fig. 1 *A*), spasm in the ascending colon in the other control films (*A* and *C*) illustrates clearly the normal variations in the pattern of the colon from day to day and from one observation to the other. In case 8 the film taken after benzedrine shows a wider lumen in the descending and transverse colon and a contracted ascending colon and

TABLE 1.—*Results in the Treatment of the Spastic Colon*

Patient					Effects		
No.	Age	Sex	Symptoms and Duration	Benzedrine Sulfate	Gastrointestinal	Miscellaneous	Comment
1	50	♀	Right lower quadrant and umbilical pain; bloating, constipation; chronic exhaustion; 3 yrs.	10 mg. three times a day for 4 wks.	Improved	Nose, mouth and throat very dry	No previous therapy
2	40	♀	Right lower quadrant pain, 3 wks.; belladonna, bromide and diet ineffective	10 mg. and 5 mg. daily for 1 wk.*	No pain since benzedrine was started	.....	1 yr. ago symptoms relieved by belladonna, bromide and diet
3	50	♀	Sharp lower abdominal pains after meals for years; 2-3 bowel movements daily; 1 mo.	10 mg. and 5 mg. daily for 1 wk.*; 10 mg. twice a day for 1 wk.	Pain disappeared in 1 day; b.m's. normal after larger dose was given	Nose, mouth and throat very dry	Hot flushes (menopausal) less frequent and milder
4	33	♀	Right lower quadrant pain and diarrhea when tired, 1 mo.; bland diet and atropine gave much relief but not complete; mucus 4+	10 mg. and 5 mg. daily for 7 days, then 10 mg. twice a day*	No pain after 4 days; recurred in 12 days while on benzedrine; mucus as before	Peppier and tenser; less tired; 30 mg. daily caused headache 4+; very irritable, more alert	Same symptoms 2 yrs. ago; complete relief by belladonna and bromide; dysmenorrhea relieved
5	33	♂	Epigastric pressure; flatulence; "pencil" stools; tiredness 4+ off and on; 3 yrs.	10 mg. and 5 mg. daily for 12 days*	Unimproved	½ hr. after 10 mg. felt "peppy" for 1 hr.	Improved on bromide, bismuth subcarbonate and calcium gluconate
6	20	♀	Marked constipation; occasional cramps and diarrhea; mucus; chronic exhaustion; 1 yr.; refractory to all therapy	5 mg. twice a day for 4 days; 10 mg. twice a day for 10 days	Unimproved	.....	Basal metabolic rate −2
7	19	♀	Severe abdominal cramps; bloated; constipation; mucus, 1 yr.; refractory to all therapy	10 mg. twice a day for 2 wks.	Unimproved		
8	39	♀	Nausea; abdominal pains; exhaustion; 1 yr.	10 mg. twice a day for 17 days	Unimproved	Exhaustion improved for 1 wk.; then relapse	
9	27	♀	Abdominal pains; alternating constipation and diarrhea; mucus; marked diffuse abdominal tenderness; tired; 8 mos.	10 mg. twice a day for 4 wks.	Unimproved	Frequent urination; tiredness unimproved	
10	29	♀	Right lower quadrant and umbilical pains; bloating; alternating constipation and diarrhea 4+ mucus; tired; weak; 2 yrs.	10 mg. and 5 mg. daily for 7 days; 10 mg. twice a day for 7 days; 10 mg. three times a day for 7 days	Unimproved	30 min. after 30 mg.: tremor, severe abdominal cramps, "faintness," numbness, dizzy, pressure in head, diminished hearing; very weak, rash; temperature 95.5 F., nausea	
11	36	♀	Abdominal cramps, diarrhea mucus, bloating, constipation, tired; 3 yrs.	10 mg. twice a day for 24 days	Unimproved	Tiredness unimproved	
12	34	♀	Abdominal cramps, recurrent diarrhea, urgency, mucus, distention, nausea; 2 yrs.	10 mg. twice a day for 24 days	Unimproved	Temporary insomnia, palpitation and dyspnea; mouth dry	
13	50	♀	Abdominal cramps, diarrhea, mucus 4+, diffuse abdominal tenderness; 6 yrs.; refractory to all therapy	10 mg. twice a day for 8 days	Unimproved		
14	46	♀	Epigastric cramps, fulness, diarrhea and urgency after meals; 7½ yrs.	10 mg. and 5 mg. daily for 1 wk.*; 10 mg. twice a day for 1 wk.	Unimproved		
15	42	♀	Generalized abdominal pains, and constipation	10 mg. twice a day for 1 wk.; 10 mg. three times a day for 1 wk.	Unimproved		
16	28	♀	Epigastric cramps; alternating constipation and diarrhea; mucus; exhaustion; 1 yr. off and on	10 mg. twice a day for 1 day	Pain and diarrhea increased	Markedly weak, dizzy, "faint," palpitation, tachycardia, tremor and anxiety 3 hrs. after 1st dose; lasted 20 hrs.	Bromide and atropine resumed; improvement
17	19	♀	Abdominal pains, diarrhea, urgency, mucus 4+; 4-5 yrs.; refractory to all therapy	5 mg. twice a day for 1 day	Severe cramps; diarrhea increased	"Exhilaration"; insomnia	
18	33	♀	Abdominal cramps; alternating constipation and diarrhea; mucus; 8 yrs.; drowsy, exhausted	10 mg. twice a day for 3 wks.	Pain increased; developed mild right upper quadrant pain; b.m's. unchanged	More alert; insomnia; dry mouth	

* Ten mg. before breakfast, and 5 mg. before lunch.

thus demonstrating the physiologic effect sometimes noted with successive enemas, as previously referred to. Following benzedrine sulfate (fig. 1 *D*), little if any change can be demonstrated when compared with the preceding control enema (fig. 1 *C*). When the filling of the colon following benzedrine (*D*) is compared with that of the control (*B*), the latter shows a slightly wider lumen in the descending colon and spasm of the ascending colon and hepatic flexure. The absence of cecum, the number of haustrations in the transverse colon being the same as in the control (fig. 2). It is worthy of note that the spasm in the ascending colon may in itself, by distal expulsion of the barium, account for the wider lumen in the transverse and descending colon, without the latter being ascribed to a benzedrine effect.

A different series of observations were made in cases 2, 11 and 12. A barium sulfate enema was given on

one day, and the film taken was used as a control. Two days later this procedure was repeated, 30 mg. of benzedrine sulfate being administered orally twenty-five minutes before the enema was given. In case 2 no apparent change in the pattern of the colon was noted following benzedrine, yet clinically distinct improvement was reported (table 1). In case 12 there appeared to be little if any effect other than slightly increased spasm in the descending colon and better filling in the ascending colon. Patient 11 showed definite relaxation of the colon following benzedrine (fig. 3), although no improvement was manifest therapeutically (table 1).

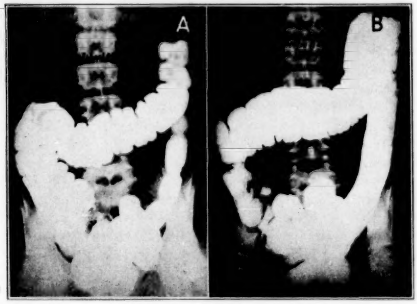

Fig. 2 (case 8).—Control (*A*) followed by second enema (*B*) fifteen minutes after 30 mg. of benzedrine sulfate orally. Apparent relaxation of the transverse and descending colon with contraction of the ascending colon and cecum following benzedrine (*B*).

TABLE 2.—*Gastric Emptying Time of Dogs Following Subcutaneous Injection of Benzedrine Sulfate*

Dog	Benzedrine Sulfate, Mg. Subcutaneously	No. of Tests	± % Change from Average Emptying Time
2	0.5	1	+21
	2.0	1	+37
	5.0	2	−23, −5
	10.0	2	+39, +20
	25.0	2	+61, +46
3	0.5	1	+13
	2.0	1	— 7
	5.0	1	+45
	10.0	1	+79
	25.0	2	+91, +73
6*	25.0	1	+35
7	5.0	1	+37
	30.0	1	+25
8	1.0	2	+31, −7
	2.0	3	+11, −10, −28
	5.0	1	+15
	10.0	1	+62
	25.0	2	+108, +147
9	25.0	1	+85

* Weighed 15 Kg.; all others 10 Kg.

PHARMACOLOGIC STUDY OF THE EFFECTS OF BENZEDRINE SULFATE ON THE STOMACH AND SMALL INTESTINE OF DOGS

A study on dogs was undertaken first in order to exclude "reversal" effects with increasing doses of benzedrine and, secondly, in order to analyze the action of this drug more closely than could be done on human subjects.

All dogs used were thoroughly trained to our procedures. They were used only twice a week and the interval was sufficient for complete emptying of residual barium from the bowels. Before and after every experiment controls were performed without drugs, and only such experiments are reported in which the dogs appeared to be in good health and in which the controls were uniform. The barium meal was given by stomach tube and consisted of 130 Gm. of barium sulfate, 30 Gm. of dried whole milk (Klim) [12] and 300 cc. of water. This meal was found to be very satisfactory and to yield rather constant control values. The emptying time was counted from the first appearance of barium in the duodenum until from 95 to 100 per cent of the barium had left the stomach. Benzedrine sulfate was given by subcutaneous injection at the time of the barium meal. In a number of tests roentgenograms were taken in addition to the fluoroscopic observations. Forty-five tests with benzedrine sulfate and more than 200 control observations were performed on six dogs.

From table 2 it appears that in most experiments a delay in emptying occurred with small and large doses of benzedrine sulfate and that the prolongation of the emptying time was roughly proportional to the dose. According to body weight, the dose of 5 mg. in dogs 2, 3, 7, 8 and 9 corresponds approximately to the dose of 30 mg. given to human beings. In a few experiments the emptying time was shortened. It is not believed, however, that this represents a true reversal effect, because the changes were too inconsistent (e. g., dog 8 in table 2). For approximately fifteen minutes after injection of benzedrine sulfate the stomach emptied with normal speed; thereafter an almost complete closure of the pylorus occurred, which lasted from an hour to an hour and a half. This was true for doses from 0.5 to 30 mg., but with the smaller doses this effect was of shorter duration. From ninety to 120 minutes after injection practically normal emptying was resumed. While the stomach appeared to have less tonicity when its emptying was inhibited by benzedrine, nevertheless waves of peristalsis were observed (figs. 4 and 5). These were not able, however, to propel barium through the pylorus. Neither tilting of the dogs nor manual pressure exerted on the stomach was effective in forcing barium into the duodenum. At the time when more or less complete arrest of emptying of the stomach occurred, the duodenal cap, which was usually seen in our controls, was not visible; further, we observed during this time a state of spasticity of the

Fig. 3 (case 11).—Barium enema on different days. *A*, without benzedrine; *B*, twenty-five minutes after 30 mg. of benzedrine sulfate orally. Relaxation of the transverse colon (*B*) apparent. Clinically no improvement.

12. The Borden Company supplied the Klim for this study.

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small bowel and an arrest of propulsion, with a thinning and in part beady appearance of the barium, which before was present in large, more or less continuous masses. The spasm of the small intestine disappeared when the effect of benzedrine wore off and normal emptying of the stomach was resumed. This observation of a spastic contraction of the small intestine was more apparent when the benzedrine sulfate was injected thirty or sixty minutes after the giving of the barium meal. In the latter experiments a considerable amount of barium had by this time left the stomach and had accumulated in the small intestine in large, more or less continuous masses. Approximately fifteen minutes after injection propulsion of these masses ceased, and they assumed a streaky, beady appearance as already described.

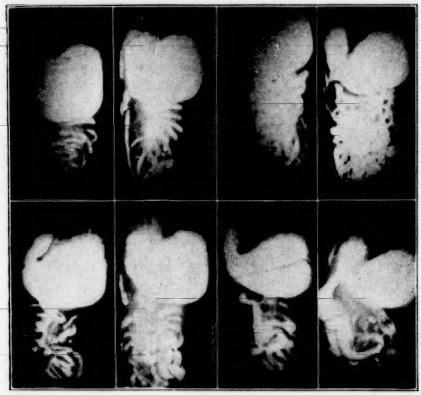

Fig. 4 (dog 3).—Upper row: controls thirty, sixty, ninety and 120 minutes following barium meal; lower row: thirty, sixty, ninety and 120 minutes following barium meal and injection of 20 mg. of benzedrine sulfate. At the end of thirty minutes a second injection of 5 mg. of benzedrine sulfate was given. Note the disappearance of the duodenal cap and the contraction of the small intestine at the sixty and ninety minute periods as compared to the control. A lump of barium is retained in the descending part of the duodenum, and the barium in the small intestine appears discontinuous, thinner and in parts beady.

In view of these observations, the emptying time of the stomach was studied in two normal human subjects, the control observations of one day being compared with those noted three days later after 30 mg. of benzedrine sulfate administered with the barium meal. In both cases benzedrine prolonged the emptying time approximately one hour. Spasm of the pylorus appeared fifteen minutes after the administration of benzedrine and lasted thirty minutes, and motility of the small intestine was delayed, thus concurring with the studies on dogs.

COMMENT

The disappointing clinical results observed in the treatment of the spastic colon are at variance with the beneficial effects reported by Myerson and Ritvo,[9a] but find corroboration in the variety of antithetic symptoms noted by Davidoff and Reifenstein.[13] Moreover, the diverse effects observed roentgenographically and herein recorded afford some explanation of our clinical failures and leave much to be desired therapeutically.

It must be pointed out that in the treatment of this disorder, the symptoms of which are so closely correlated with the psychic state of the individual, very often the mere change to a bland diet, reassurance, warm applications to the abdomen, rest, relaxation or mild sedation will effect improvement and that, unless carefully controlled studies are conducted, evaluation of the efficacy of this drug is difficult. Further, the differentiation between the physiologic variations and the pharmacologic effect of benzedrine sulfate by means of barium enemas may yield untrustworthy results, as indicated by the foregoing studies.

Pharmacologically, benzedrine has been described as a drug with prevailing effects through the sympathetic nervous system. It may therefore be that per se, like the closely related ephedrine,[14] it produced in our dogs a contraction of the pylorus similar to that observed frequently following stimulation of the splanchnic nerves. The same mechanism may also have produced a relative relaxation of the distended stomach. Another explanation may be found in the observation of Luckhardt, Phillips and Carlson,[15] who noted contraction of the pyloric sphincter resulting from mechanical irritation of the duodenum; this would apply to our results if we assume that benzedrine sulfate produced primarily a spasm of the duodenum. The biologic mechanism of benzedrine seems to be rather complicated, however, and in consequence of a number of fundamental differences between the pharmacologic effects of epinephrine and benzedrine, Tainter[16] designated the latter a pseudosympathicotropic drug. From their studies on excised segments of the intestine of rabbits, rats, guinea pigs and cats, Detrick, Millikan, Modern and Thienes[17]

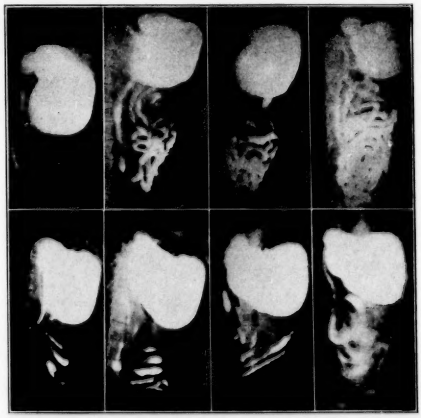

Fig. 5 (dog 7).—Same as in figure 4. The inhibition of emptying is more marked than in figure 4.

13. Davidoff, Eugene, and Reifenstein, E. C., Jr.: The Stimulating Action of Benzedrine Sulfate, J. A. M. A. **108:** 1770 (May 22) 1937.

14. Van Liere, E. J.; Lough, D. H., and Sleeth, C. K.: The Effect of Ephedrine on the Emptying Time of the Human Stomach, J. A. M. A. **106:** 535 (Feb. 15) 1936.

15. Luckhardt, A. B.; Phillips, H. T., and Carlson, A. J.: Contributions to the Physiology of the Stomach: II. The Control of the Pylorus, Am. J. Physiol. **50:** 57 (Oct.) 1919.

16. Tainter, M. L.: Comparative Actions of Sympathomimetic Compounds, Arch. internat. de pharmacodyn. et de thérap. **46:** 192 (Oct. 15) 1933.

17. Detrick, L. E.; Millikan, R.; Modern, F. S., and Thienes, C. H.: On the Pharmacology of Phenylisopropylamine (Benzedrine), J. Pharmacol. & Exper. Therap. **60:** 56 (May) 1937.

concluded that, for visceral structures, benzedrine is neither a true sympathicotropic drug nor a typical muscle stimulant. One of its most frequent side effects in patients is distinct dryness of the mouth, which may be due to an atropine-like action. Probably it also has a direct effect on muscle.[18]

From our observations in dog and in man, benzedrine sulfate does not effect a relaxation of the pylorus but produces pylorospasm, prolongation of gastric emptying time and spasm of the small intestine. Our results are thus opposed to those of Myerson and Ritvo,[9] and in part to those of Smith and Chamberlin,[10] who observed a release of pylorospasm following benzedrine in patients with ulcer and retardation of emptying of the stomach and small intestine in both normal persons and patients with duodenal ulcer. Spasm of other sphincters, namely urinary and rectal, has also been observed following the use of benzedrine sulfate.[19]

It is a frequent observation on patients that after a barium meal no gastric emptying occurs for periods up to fifteen minutes; transitory pylorospasm seems to be present and is believed by some to be due to apprehension and fear. Myerson and Ritvo [9] noted that the effect of benzedrine sulfate on the pylorus began from five to ten minutes after oral administration, whereas Smith and Chamberlin [10] noted almost immediate relaxation of spasm of the duodenum and colon after parenteral administration. This does not necessarily mean that these results should be ascribed to benzedrine, for in man (orally) and in dog (parenterally) we observed a period of approximately fifteen minutes before the drug became effective and a much longer period before its maximum action occurred. This, we believe, explains the discrepancy between our finding of pylorospasm and that of pyloric relaxation noted by the earlier observers.

SUMMARY AND CONCLUSIONS

1. Of eighteen patients with a spastic, irritable colon treated with benzedrine sulfate, three improved, one showed improvement followed by relapse, eleven were unimproved and three were worse. The lack of uniformity in its effects on the spastic colon, as observed roentgenographically in five patients, restricts its clinical usefulness to a considerable degree.

2. In two normal subjects and in the dog, benzedrine sulfate produced pylorospasm and enterospasm and prolonged the emptying time of the stomach and small intestine.

3. Benzedrine sulfate is not recommended in the treatment of spastic disorders of the gastrointestinal tract.

Twenty-Ninth Street and Ellis Avenue.

18. Boyd, E. M.: On the Stimulant Effect of Benzedrine Sulfate, Proc. Soc. Exper. Biol. & Med. **37**: 127 (Oct.) 1937.
19. O'Connor, D. M.: Benzedrine, Brit. M. J. **1**: 43 (Jan. 2) 1937.

Bismarck Challenged Virchow.—For years Virchow was a member of parliament, where he was one of a group, including Mommsen, who were in opposition to Bismarck. In 1865 Virchow defeated the government on a motion to create a German navy, and Bismarck was so enraged that he challenged the professor. The chancellor informed the professor by letter that the minister of war would be one of his seconds. Virchow declined the challenge, saying that his life was too valuable to mankind to be put to the chance of a duel with a politician but proved his courage, ere many years had passed, by his promptitude in going to the front with the medical corps when the Franco-Prussian War broke out.—Carr, James G.: Rudolph Virchow, *Northwestern University Bulletin* **38**:1 (Jan. 31) 1938.

HEMOPTYSIS IN MALIGNANT HYDATID MOLE

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Pulmonary hemorrhage, when associated with a neoplasm elsewhere in the body, is a symptom fraught with great concern and is usually regarded as evidence of an early demise on the part of the patient. The portent of pulmonary hemorrhages when associated with invasive hydatid mole has not the same ominous prognosis. We have had the opportunity to study by repeated roentgen examinations and biologic hormone assays a patient with an invasive hydatid mole. In spite of multiple metastatic (?) pulmonary foci and the resultant bouts of hemoptysis, she made an uneventful recovery following total hysterectomy.

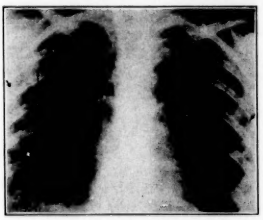

Fig. 1 (Jan. 14, 1937).—Circumscribed foci can be seen scattered throughout both lungs, particularly behind the first, second and third anterior interspaces on left. Biologic hormone assay for gonadotropic substance revealed 5,000 mouse units per liter of urine.

REPORT OF CASE

A married white woman aged 22 was admitted to the Millen Hospital, Millen, Ga., Dec. 9, 1936, with backache, abdominal pain, irregular bleeding from the vagina of five weeks' duration and incessant vomiting for three weeks. Eleven weeks had elapsed since her last normal menses. She lost 24 pounds (11 Kg.) and now weighed 114 pounds (52 Kg.). Examination revealed a uterus which was enlarged to the size of a three and a half months pregnancy. Pain and bleeding ceased with rest in bed and she was dismissed one week after admission. Jan. 11, 1937, she was readmitted to the hospital because of irregular bleeding, which had become profuse during the ten preceding days. Her weight was further reduced to 102 pounds (46 Kg.). Shortly after admission she had a pulmonary hemorrhage. Six hours later this was followed by a second but more profuse one. Pulmonary hemorrhages recurred every two or three days. The uterus was emptied of a hydatidiform mole, which was examined in the pathologic laboratory of the University of Georgia School of Medicine. Bleeding was so excessive as to necessitate packing of the uterus.

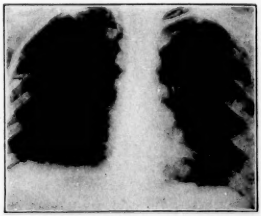

Fig. 2 (March 2, 1937).—Note the regression of shadows behind first anterior interspace on both sides. Focal mass still prominent behind right second interspace. Biologic hormone assay for gonadotropic substance revealed 150 mouse units per liter of urine.

The patient was given several blood transfusions. Roentgen study of the lungs January 14 revealed many focal nodules throughout both lung fields (fig. 1). January 15, biologic assay

From the University of Georgia School of Medicine.

of the urine for its gonadotropic content revealed 5,000 mouse units per liter.

January 21 a supracervical hysterectomy was performed and the specimen submitted to the University of Georgia School of Medicine for pathologic study.

The first specimen was a bulky hydatidiform mole. Microscopically there was pronounced proliferation of the Langhans cells. This suggested the possibility of invasion. When the uterus was removed it was found to be enlarged to one and a half times the normal size. Two small rounded hemorrhagic areas 1 by 1 cm. were found bulging the serosal surface on the posterior and fundal aspects of the uterus. The lateral serosal surfaces of the uterus showed a bluish mottled discoloration in contrast to the pinkishness of the remaining surfaces. On section the endometrial cavity and the inner muscular layer of the uterus, particularly near the fundal margins, were filled with a granular, spongy bluish gray tissue. The bluish areas were recognized as enlarged, hydropic villi. The underlying myometrium was deeply invaded by a few of the villi (fig. 4).

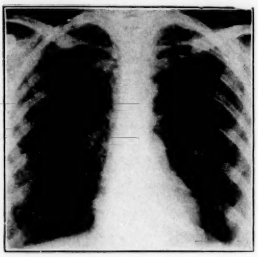

Fig. 3 (Jan. 15, 1938).—Note the disappearance of all focal masses throughout both lung fields. Friedman test negative Nov. 11, 1937.

Many sections of the uterus revealed the myometrium invaded by villi covered by proliferating layers of Langhans' cells and syncytium. A marked syncytial cell reaction in the surrounding myometrium accompanied this process (fig. 5). In other sections villi were absent but occasional zones of syncytial cell hyperplasia were noted. In some of the venous sinuses, sheets of syncytial cells were observed (fig. 6).

The hemorrhagic nodules previously mentioned showed on section only blood cells and fibrin and were void of trophoblastic elements.

The diagnosis was invasive hydatid mole.

The lung fields were again roentgenographed Feb. 7, 1937 (fig. 2), and some regression of the focal pulmonary masses was in evidence. Another biologic assay of the urine at this time revealed but 150 mouse units of gonadotropic substance per liter.

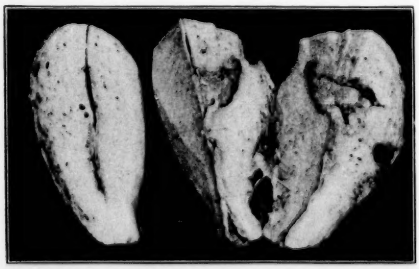

Fig. 4.—Uterus sectioned to demonstrate the invasiveness of the lesion and the site of the two hemorrhagic nodules.

On roentgen study of the chest June 15, 1937, the lung fields were clear. Repeated examination of the sputum for tubercle bacilli was negative.

The patient's convalescence was slow but steady and at the present time she is perfectly well.

No radiation therapy was ever attempted. A Friedman test performed Nov. 11, 1937, was negative. Roentgenograms of the chest Jan. 15, 1938 (fig. 3), showed complete regression of the tumor masses.

COMMENT

Schmorl first presented evidence that in pregnancy syncytial masses are often carried from the uterus and lodged in pulmonary and other capillaries. He found these detached cells in the pulmonary veins in 80 per cent of 150 eclamptic patients studied at autopsy. Schmauch,[1] in his exhaustive study on chorionepithelioma, emphasized that the mere presence of chorionepithelial cell masses inside of veins was no proof of a malignant condition. He gave notice that the destructive hydatid moles or placental polyps do not give rise to metastases but often lead to embolism of the lungs and villous infarcts of the vagina. Ewing[2] quoted Fleischman as having collected from the literature in 1905 seven cases of recovery from "chorioma" with pulmonary metastases. McClellan[3] reported a case of atypical chorionepithelioma in which the patient during the course of her illness was seized with sharp pains in the left side of the thorax and began to cough with a bloody expectoration. Examination of the sputum showed syncytial cells. The patient recovered. Lackner and Leventhal[4] recently reported a case of chorionepithelioma with pulmonary metastases and their patient recovered following extensive courses of radiation therapy.

Fig. 5.—Section of uterus. Note the invasion of the myometrium by villi and the accompanying marked proliferation of the Langhans cell and syncytium layers. In lower right corner a marked syncytial cell hyperplasia pervades the myometrium.

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2. Ewing, James: Chorioma, Surg., Gynec. & Obst. **10**: 366, 1910.
3. McClellan, B. R.: Tr. Am. Assn. Obst. & Gynec. **38**: 161, 1915, quoted by Rosenzweig, Maxwell: Syncytial Endometritis and Syncytioma, Am. J. Obst. & Gynec. **13**: 563 (May) 1927.
4. Lackner, J. E., and Leventhal, M. L.: Chorionepithelioma of the Uterus, J. A. M. A. **98**: 1136 (April 2) 1932.

Our patient made a complete recovery without any radiation therapy. This type of case is frequently interpreted as chorionepithelioma with pulmonary metastases in which spontaneous regression has occurred. We are inclined to regard such neoplasms as (locally) malignant hydatid moles and not as true chorionepitheliomas,[5] although it is quite possible for chorionepitheliomas to arise from such growths. Deportation of syncytial masses or even villi are not infrequent catastrophes in invasive mole. These deportations often lodge in the lungs or vagina and are notoriously known to regress in the majority of instances, particularly after removal of the uterus.

In a process which normally impinges on and proliferates within blood spaces, an occasional pulmonary infarct should not prove astonishing. Therefore pulmonary symptoms, from a prognostic standpoint, should not be valued too highly. However, deported placentary cells may proliferate. In molar pregnancy progressive changes will be found constantly in placentary cells deported to the lungs, and even in partial mole Schmorl was able to demonstrate an invasion of the wall of blood vessels in the lungs by these cells. Transitory proliferation of these syncytial cells may take place, but their ultimate fate is demonstrated by the cicatrices frequently observed in such lungs. Ewing [2] doubted that malignant tumors could develop from deported, normal or originally harmless cells of the chorion and placenta.

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SUMMARY

In a case of invasive mole, hemoptysis was a prominent feature. Roentgen studies of the chest revealed metastatic foci in the lungs. Following hysterectomy and without radiation therapy, the metastatic pulmonary foci regressed and the patient recovered. The biologic hormone assay for gonadotropic substance in the urine was only 5,000 mouse units per liter before hysterectomy and 150 mouse units per liter three weeks after operation. These low hormonal values were in harmony with the regressive features of the neoplasm and were indicative of a hopeful prognosis. The hemoptyses in such cases are due to puimonary deportation of villi or syncytial cell masses with transitory proliferation rather than true metastases. Removal of the primary focus, i. e., hysterectomy, should always be performed regardless of the seeming hopelessness of the situation.

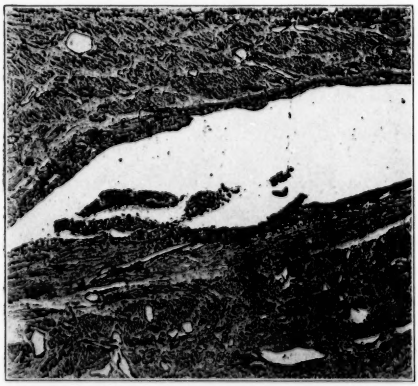

Fig. 6.—A mass of syncytial cells lie free in one of the uterine sinuses.

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Clinical Notes, Suggestions and New Instruments

PYOGENIC OSTEOMYELITIS OF THE SPINE, MEDIASTINAL ABSCESS AND COMPRESSION OF THE SPINAL CORD

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We are reporting this case because of the rarity of the condition (only one similar case is recorded in the literature) and because it illustrates the proper therapeutic approach to osteomyelitis of the spine when it is complicated by mediastinal abscess and compression of the spinal cord.

REPORT OF CASE

S. S., a white boy, aged 17, was admitted to the Montefiore Hospital on May 27, 1937, with a diagnosis of active rheumatic fever. His past history included measles and a tonsillectomy in early childhood. In September 1936 a furuncle appeared on the right cheek, and he squeezed it. Three days later fever and a chill developed. The fever persisted, and after ten days there developed pain, swelling and limitation of motion in the left knee and the right elbow, which lasted three weeks. A diagnosis of rheumatic fever was made by the family physician and a consultant.

The patient was admitted to a hospital, where a heart murmur was allegedly found. After three weeks he returned home and experienced a recurrence of pain in his knee and a transient involvement of his right shoulder. In the middle of November there developed throughout the lower half of the chest a moderately sharp, intermittent and nonradiating pain, which persisted for several weeks.

In the latter part of December he had a severe, viselike, agonizing pain in the back, which radiated around both sides of the chest to the front and was brought on by the slightest motion of his body, even by the slight motion in breathing. This pain subsided after one week.

During all this time an irregular fever and tachycardia were present.

In January 1937 epigastric pain and anorexia occurred. At the same time the patient noted weakness of the left leg and spontaneous movements of both lower extremities. In February he noticed loss of sensation in the lower portion of the trunk and the right lower extremity. His condition remained unchanged until two weeks before his admission to the Montefiore Hospital, in May, at which time he complained of loss of sensation in the bladder, marked dysuria and difficulty in voiding.

On admission, he appeared chronically ill. His weight was 99 pounds (45 Kg.), his temperature 100 F. and his pulse rate 135. Examination gave negative results except for the neurologic observations. No heart murmur was detected.

There was weakness of both lower extremities, with bilateral Babinski signs and ankle clonus. In addition there was impairment of sensation to the level of the eighth dorsal segment. A neurologic consultant confirmed the bilateral signs referable to the pyramidal tract and found an irregular sensory level between the sixth and the ninth dorsal segment. A diagnosis of epidural abscess with compression of the spinal cord was made.

From the Neurological and Surgical Divisions of the Montefiore Hospital.

Examination of the blood revealed 75 per cent hemoglobin (Sahli), 4,700,000 red cells and 17,500 white cells, of which 74 per cent were polymorphonuclear. A blood culture and the Wassermann reaction were negative.

Lumbar puncture yielded clear fluid. The initial pressure was 160 mm. of water. There were poor rises on jugular compression and delayed return to normal, indicative of partial block. The Pandy test showed a 3 plus reaction; there were 63 mg. of total protein per hundred cubic centimeters and 2 white cells per cubic millimeter.

Fig. 1.—Anteroposterior view, showing the spindle-shaped mass in the mediastinum.

Roentgenograms of the chest and the vertebral column showed a spindle-shaped mass in the mediastinum, adjacent to the spine (fig. 1), and partial absorption of the fifth and sixth dorsal vertebrae anteriorly (fig. 2). The diagnosis was modified to osteomyelitis of the vertebrae, with mediastinal abscess, and extension of the infection into the spinal canal, with compression of the spinal cord.

On June 4 a diagnostic aspiration was performed posteriorly in the fifth intercostal space, 2 inches to the right of the midline, and sanguineopurulent material was obtained. This showed Staphylococcus aureus on smear and culture.

On the following day the patient was operated on under general anesthesia. Portions of the fifth and sixth ribs were removed paravertebrally on the right side, and a large abscess was incised and drained. The abscess cavity was in direct communication with the vertebral column.

Fig. 2.—Lateral view, showing (*a*) the mediastinal mass, (*b*) the trachea displaced anteriorly and (*c*) partial destruction of the bodies of the fifth and sixth dorsal vertebrae.

At operation the patient suffered an accidental pneumothorax, and after a rather stormy postoperative course, during which pyopneumothorax developed, he began to improve. At the present time (October 1937) he is up and about and has gained 25 pounds (11 Kg.) since the time of his admission to the hospital, five months ago.

A neurologic examination done six days postoperatively showed some return of sensation to the bladder and a moderate increase in the power of the lower extremities. There was slight improvement in sensation, and no Babinski sign could be elicited.

The temperature of the patient gradually fell to normal, and three weeks after the operation no sensory level was demonstrable.

At present there is still a residual hyperreflexia, with slight impairment of the vibratory sense in the lower extremities and minimal weakness of the left lower extremity. Spinal fluid pressures are normal, and there is no evidence of block. There has been complete resorption of the pleural empyema (fig. 3), and the vertebrae show marked evidence of repair.

COMMENT

The illness probably began with transient bacteremia, secondary to the furuncle on the face. Metastatic involvement of the joints and the dorsal spine followed. There was extension from the latter into the mediastinum anteriorly, with abscess formation, resulting in the diffuse pain in the chest, and later posterior extension into the epidural space, with consequent severe root pain. Slowly progressive compression of the cord then ensued, due possibly either to pressure of frank pus or to the formation of chronic epidural granulation tissue or both. It may have been due to changes in the cord secondary to involvement of the vessels. Operative intervention through the mediastinum permitted drainage and relieved the compression, as was revealed by the neurologic status six days postoperatively.

Schwarz [1] reported a very similar case. A 5 year old girl had osteomyelitis of the vertebrae which ruptured posteriorly and became evident as an abscess of the back. After simple incision and drainage, slight meningeal signs developed. A laminectomy was performed, and pus drained from the epidural space. The dura was covered with granulation tissue. Another laminectomy was necessary at a lower level to permit adequate drainage. The patient did not improve, and it was only after an interval of two months, when x-ray examination revealed the presence of a mediastinal abscess, that a posterior rib resection was done and the abscess drained. The child then recovered. There was no evidence of compression of the cord in this case.

Fig. 3.—Anteroposterior view, showing complete disappearance of the mediastinal abscess. The evidence of the rib resection is apparent on the right.

In our case the decision to drain the abscess through the mediastinum was a fortunate one and resulted in rapid recovery. Had a laminectomy been performed to relieve the compression of the spinal cord, the result (as in Schwarz's case) would not have been as dramatic as it was and the condition might have terminated with fatal meningitis.

In 1904 Hunt [2] maintained that all acute epidural abscesses are secondary to osteomyelitis of the spine. This view has been accepted by several others but in general has not found wide favor. In July 1937 Browder and Meyers [3] reported seven cases of epidural infection; a definite vertebral lesion was discovered in six and could not be excluded in the seventh. Our case is another which illustrates the fundamental relationship of osteomyelitis of the spine to epidural inflammations.

SUMMARY

In a case of osteomyelitis of the spine complicated by mediastinal abscess and epidural inflammation, with compression of the spinal cord, posterior rib resection resulted in adequate drainage of the mediastinal abscess and prompt relief of the compression and permitted healing of the osteomyelitis. In a case of this kind, a mediastinal approach is preferable to a laminectomy as a method of drainage.

1. Schwarz, E.: Ein Beitrag zur Frage der Osteomyelitis der Wirbelsäule mit Beteiligung des Rückenmarks, Beitr. z. klin. Chir. **119**: 151, 1920.
2. Hunt: M. Rec. **65**: 641, 1904.
3. Browder, E. J., and Meyers, R.: Am. J. Surg. **37**: 4 (July) 1937.

ALLERGY TO ORAL ADMINISTRATION OF LIVER CONCENTRATE

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In a recent issue of THE JOURNAL Criep[1] recorded an instance of allergy to the injection of liver extract. I have recently observed a similar instance of allergic reaction to liver concentrates administered orally, which allergy had not been acquired from the previous administration of liver, and the reaction was accompanied by uterine bleeding. I have been unable to find any record of a similar instance; therefore, the following case would seem worthy of being recorded:

REPORT OF CASE

Mrs. L. W., a white woman aged 32, gave a history of regular menstruation every twenty-one days since the age of 12. Her periods had been interrupted only by two pregnancies, once in 1933 and again in 1936. She gave a history of allergic reaction to strawberries and any product containing sodium bicarbonate of any appreciable amount. She also suffered from ragweed hay fever in season.

Jan. 19, 1937, curettement and perineal and cervical repair were done for injuries received during labor in 1933. Physical examination was essentially negative except for lack of free hydrochloric acid in the stomach, which finding was associated with sporadic attacks of diarrhea that were controlled by taking diluted hydrochloric acid with her meals. The patient had an uneventful recovery from her operation and a month later consulted me because of weakness and a tired feeling. The red blood cell count was 4,000,000 and hemoglobin 80 per cent. Hence she was given lextron,[2] two capsules three times a day. Immediately after the administration of this liver concentrate she complained of severe weakness, dizziness and palpitation and was forced to go to bed. The following day she began to menstruate very profusely, and it was necessary to give her fluidextract of ergot, 1 drachm (4 cc.) every three hours, and elevate the foot of the bed to control the bleeding. She inquired at that time whether she was taking liver and stated that she had had a spell similar to the present one following the administration of jeculin,[3] after the delivery of her first child, and that she continued to flow heavily until the jeculin was discontinued. I immediately discontinued the lextron and two days later the patient was able to get out of bed but was still weak and dizzy. May 4 I decided to find out whether her symptoms were coincidental or were an allergic response to the administration of the liver concentrate. During the months of March and April she had been quite regular in her periods. Thus, on the 4th of May she was given one capsule of lextron. The following day two capsules were given and she became weak and dizzy and complained of palpitation. The next day, after the administration of two more capsules of lextron, bleeding began with cramps, and the next day the uterine hemorrhage was very striking. Medication was discontinued but she continued to flow for two more days. May 12, regular menstruation began, lasting two days and requiring two pads daily. She had no bleeding then until the 16th, when she was given two capsules of extralin with a recurrence of all her symptoms and some spotting. Medication was discontinued and she had a normal menstrual period on May 31. On June 9 she was again given two capsules of extralin with the same symptoms as on the previous occasion. Since that time she has been given no more liver concentrate and her periods have been quite regular. After discontinuing the liver, the patient was given iron and ammonium citrate and numerous other iron preparations in capsule, tablet and liquid form and she suffered no untoward manifestations. None of the liver extracts were administered intramuscularly or intravenously.

I concluded that, since extralin contains liver-stomach concentrate, lextron contains in addition iron and ammonium citrate and extralin contains vitamins B_1 and G and liver-stomach concentrate, and jeculin contains red bone marrow in addition to the ingredients of lextron but no stomach, the only ingredient common to the three products, each of which produced the allergic manifestations, was the liver extract, and the iron preparations were ruled out by trial.

521 First Street.

1. Criep, L. H.: Allergy to Liver Extract, J. A. M. A. **110:** 506 (Feb. 12) 1938.
2. Lextron is manufactured by Eli Lilly & Co.
3. Jeculin is manufactured by the Upjohn Company.

Special Article

HOSPITAL AIR CONDITIONING

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Medical research and hospital experience in the past ten years have indicated the value of air conditioning as an aid in certain therapeutic procedures. The experience of nearly fifty institutions using air conditioning in one or more wards has been reviewed in a recent report [1] of the American Hospital Association.

In the present paper are outlined the objectives and special problems arising in the control of ward atmospheres, with special reference to operating rooms, postoperative wards, nurseries for premature infants, fever cabinets or rooms, allergen-free rooms and oxygen chambers, where air conditioning has proved of value.

AIR CONDITIONING OPERATING AND POSTOPERATIVE ROOMS

The main objectives in air conditioning operating rooms are to reduce the risk of explosion of certain anesthetic gases and to protect the patient and operating personnel against extremes of heat or cold in summer or winter.

Explosion Hazard.—Ether and ethylene in themselves are not explosive, but they become explosive when mixed with air or oxygen in certain proportions.

TABLE 1.—*Approximate Limits of Inflammability of Ethylene and of Ether*
(After Coward and Jones,[2] Courtesy U. S. Department of Commerce)

	Lower Limit %	Upper Limit %
Ethylene in air	3.0	30±
Ethylene in oxygen	3.0	80±
Ether in air	1.7	6 to 50
Ether in oxygen	1.7	40±
Ether in nitrous oxide	3.8	26±

In table 1 are shown the limits of inflammability of these two common anesthetics. Although the lower limits are fairly definite, the upper limits may vary considerably, depending on a number of factors.[2]

It is evident from table 1 that the most critical period is during the "washing out" process at the end of the operation, when the concentration is diluted to the explosion range. The most serious cause of accidents is static sparks in dry atmospheres,[3] a factor that cannot be entirely eliminated by grounding the anesthesia apparatus because it is difficult to make the rubber parts conductive to electricity. By means of an

This is the fifth report of the committee established by the American Medical Association to study air conditioning. The committee includes Carey P. McCord, Detroit, chairman; Emery R. Hayhurst, Columbus, Ohio; William F. Petersen, Chicago; Horatio B. Williams, New York, and Constantin P. Yaglou, Boston.

1. Report of the Committee on Air Conditioning, American Hospital Association, Chicago, 1936.
2. Coward, H. F., and Jones, G. W.: Limits of Inflammability of Gases and Vapors, Bull. 279, U. S. Dept. Commerce, Washington, D. C., 1931.
3. Henderson, Yandell: The Hazard of Explosion of Anesthetics: Report of the Committee on Anesthesia, J. A. M. A. **94:** 1491 (May 10) 1930.

electroscope, Herb [4] has shown that grounding affects but a small section of the rubber and that segments an inch or two away retain their charge. The same probably holds true for woolen blankets and clothing.

The measures recommended by the Committee on Anesthesia Accidents of the American Medical Association [5] are humidifying the air to 55 per cent relative humidity, grounding the operating table and apparatus and making the floor conductive to earth by the use of a large sheet of metal, so that everything, including the personnel, is kept grounded at all times. In new buildings "terrazo" floors with grounded brass strips are often installed for this purpose.

Explosion may also result from a combination of oxygen with oil and grease and from several other circumstances which need not be gone into here. A high humidity in winter is advantageous not only from the standpoint of explosion but also from the beneficial effect it might have in reducing loss of fluid from exposed viscera and from the wet skin of the patient, and by permitting a lower room temperature. Humidifying apparatus and controls require constant supervision to guard against drops of humidity which might prove serious.

Desirable Air Conditions in Operating and Postoperative Rooms.—It has long been known that patients under the influence of anesthesia lose ability to regulate their own body temperature, but we still do not know much about the optimum range of air conditions that will keep the body temperature normal and in this way reduce the possibility of shock and some other postoperative complications.

Barbour and Bourne [6] found that for etherized fasting dogs the optimum temperature was about 88 F. Below 88 the body temperature fell and the blood solids increased, while above 88 the body temperature rose gradually. Administration of fluids in sufficient amounts to offset the concentration of blood induced by ether lowered the body temperature, and an air temperature of about 91.5 F. was required to maintain at normal both body temperature and blood fluids. Humidity made little difference. Such high temperatures are unbearable for the operating personnel, and a compromise is often made by keeping the room between 72 and 80 F. in cold weather with the patient carefully protected with blankets and hot water bags during and for some time after the operation.

Postoperative Heat Stroke.—Postoperative complications are probably as serious with overheating as with underheating. About twenty-five years ago, Moschcowitz [7] discovered that deaths after surgical operations were greater during summer heat waves than in cool weather and that in a number of cases the symptoms were identical with those of heat stroke. Since then, numerous other cases have been described in the literature by Botteselle,[8] Walton,[9] Martin,[10] Everett and Whitham [11] and others. Patients apparently convalescing satisfactorily from operations suddenly became prostrated in hot weather with symptoms that were typical of heat stroke. In a number of instances, the heat stroke was verified at necropsy. Dehydration from excessive loss of water and blood is believed to have been an important factor in the production of heat stroke in many cases. Coller and Maddock [12] attempted to reduce excessive water loss by lowering the room temperature and by removing blankets from the patient, but these measures had no effect.

Cooling of operating and convalescent rooms in warm weather not only protects against heat stroke during the crucial period of recovery but also improves the recuperating power of the patient as well as the comfort and efficiency of the surgical staff. In warm weather the comfortable air conditions for the operators do not differ much from those of the patient, and a compromise is, as a rule, not difficult. With a relative humidity of about 55 per cent, a temperature of about 80 will probably prove acceptable. Additional heat may be applied to the patient locally or by suitable covering, according to body temperature in individual cases. In convalescent rooms the temperature may be lowered gradually to approach the normal ward temperature, and the humidity is relatively unimportant.

Air Conditioning Equipment.—Central station plants and individual room air conditioners have proved satisfactory in operating and postoperative rooms, furnishing between six and fifteen air changes per hour of filtered and suitably humidified air, with provision for cooling and removal of excess moisture in warm summer weather. The chief disadvantage of room conditioners is their noise. Recirculation of air is not used extensively in operating rooms partly because of odors and partly because of the more expensive spark-proof equipment necessary.

A high airflow in operating rooms is desirable for three reasons: (*a*) to reduce anesthetic concentration below the physiologic threshold in the vicinity of the operating team, (*b*) to remove excessive amounts of heat given off from sterilizing equipment if inside the operating room from the powerful surgical lights, from solar radiation on walls and glass and from the bodies of the operators and (*c*) to allow extra capacity for quick preparation for emergency operations. A separate exhaust system is often desirable in order to remove gases and odors at the source. Good insulation of sterilizing equipment and thorough exhaust ventilation of sterilizing rooms adjoining operating rooms will help in reducing considerably the capacity and running cost of the cooling equipment.

Sterilization of Air.—An important recent development is the sterilization of air of operating rooms and contagious wards by the use of ultraviolet lights.[13] Hart [14] believes that many operating room infections are air borne and that the hazard may be materially reduced by direct ultraviolet radiation over the operating table, with the operators protected from radiation by means of suitable gowns, masks, gloves and goggles. In about fifty operations with large incisions there have been no infected wounds, healing was more rapid, there was little rise in temperature, and postoperative pains were less severe.

4. Herb, Isabella C.: Explosions of Anesthetic Gases, J. A. M. A. **85**: 1788 (Dec. 5) 1925.
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6. Barbour, H. G., and Bourne, Wesley: Heat Regulation and Water Exchange: The Influence of Ether in Dogs, Am. J. Physiol. **67**: 399 (Jan.) 1924.
7. Moschcowitz, A. V.: Postoperative Heatstroke, Surg., Gynec. & Obst. **23**: 443 (Oct.) 1916.
8. Botteselle, R.: Postoperative Heatstroke, Policlinico **30**: 352 (July 15) 1923; abstr. J. A. M. A. **81**: 1321 (Oct. 13) 1923.
9. Walton, A. J.: The Effect of Heat upon Operations for Exophthalmic Goiter, Brit. M. J. **1**: 1045 (June 23) 1923.
10. Martin, T. M.: Postoperative Heatstroke, J. Missouri M. A. **25**: 305 (July) 1928; abstr. Anesth. & Analg. **8**: 23, 1929.
11. Everett, H. H., and Whitham, R. H.: Postoperative Heatstroke, Nebraska State M. J. **22**: 304 (Aug.) 1937.
12. Coller, F. A., and Maddock, W. C.: Studies in Water Requirements of Surgical Patients, Anesth. & Analg. **14**: 140 (May-June) 1935.
13. Wells, W. F., and Wells, Mildred W.: Air-Borne Infection, J. A. M. A. **107**: 1698 (Nov. 21), 1805 (Nov. 28) 1936.
14. Hart, Deryl: Bactericidal Radiant Energy for the Operating Room—Operation Room Infections, Arch. Surg. **34**: 874 (May) 1937.

AIR CONDITIONING NURSERIES FOR PREMATURE INFANTS

It has long been known that one of the most important requirements in the care of premature infants is the stabilization of body temperature, because their heat-regulatory mechanism is not fully developed. The usual means for controlling the body temperature are heated beds, electric incubators, hot water pads, and the like, but most of these have not entirely fulfilled the environmental needs of premature infants, owing to limited air space, inadequate ventilation, insufficient humidification in winter, and failure to provide for cooling and dehumidification in warm summer weather.

Optimum Air Conditions.—The effects of air conditions on the growth and development of premature infants have been studied in three air-conditioned nurseries at the Infants Hospital of Boston.[15] Four criteria were used in establishing optimum conditions; viz., stability of body temperature, incidence and severity of digestive syndromes, gain in weight and mortality rate. Wide variations were found in the requirements for air temperature (from 75 to 100 F.) according to general constitution and body weight. The optimum relative humidity was placed at 65 per cent. The requirements in all cases consisted in providing (*a*) the lowest temperature that would stabilize body temperature, (*b*) a relative humidity of 65 per cent and (*c*) a ventilation rate between fifteen and twenty-five air changes per hour to maintain uniform temperature and humidity in extremes of weather and to eliminate objectionable odors which ordinarily are detected when one enters such nurseries.

Significant departures from these optimum air conditions exerted demonstrable harmful effects in these extremely sensitive reactors. When relative humidities between 25 and 50 per cent prevailed for two weeks or longer, the body temperature became unstable irrespective of air temperature, the incidence and severity of digestive syndromes increased, gains in weight diminished, and the mortality rose. On the other hand, air conditions with from 55 to 65 per cent relative humidity proved satisfactory over a period of years.

In table 2 are summarized the results of this study, including data obtained in the old nurseries prior to the installation of air-conditioning apparatus and in the conditioned nurseries with high and low humidities. All data shown are weighted averages and include all infants. Actually, the smallest infants benefited most by high humidities and the biggest least (see original report[15]). The benefits are attributed not only to improved air conditions but also to advances in medical and nursing care.

Suitable Methods for Air Conditioning Nurseries.—Most of the air-conditioning installations now in use for nurseries are of the central station type, providing for humidification and heating in cold weather and for cooling and dehumidification in warm weather with filtration and ventilation at all times.[16] Compact unit air conditioners are available at reasonable cost for installation inside, or preferably outside, the nursery, owing to noise. There are also available now completely air-conditioned incubators, the merits of which remain to be tested. Recirculation is seldom used in these wards, owing to odors and the possibility of cross infection. Improvements of methods for sterilizing air may permit partial recirculation with a significant reduction of initial and operating costs.

A single nursery conditioned to 77 F. temperature and 65 per cent relative humidity would fulfil the requirements of the majority of premature infants. Additional heat for weak infants may be furnished in the cribs, or by means of electric incubators placed inside the conditioned nursery, and the heat adjusted according to individual requirements. In this way the necessity for multiplicity of rooms and of air-conditioning units is obviated; the infants in the heated beds derive the benefit of breathing cool humid air, and the nurses and doctors need not expose themselves to extreme conditions.

TABLE 2.—*Effects of Air Conditions on Premature Infants: General Summary of Results*

Infants Hospital, Boston
(Courtesy American Journal of Diseases of Children)

Criterion	Unconditioned Nurseries 1923-1925 Natural Humidity	Conditioned Nurseries 1926-1929 Relative Humidity 25-49%	Conditioned Nurseries 1926-1929 Relative Humidity 50-75%
Initial loss of body weight in percentage of birth weight	12.4	8.9	6.0
Days to regain birth weight	26.5	19.5	15.1
Mean maximum diurnal fluctuation of body temperature, degrees F.			
(*a*) Body weights 1.5-2.5 pounds	6.3	4.3	3.6
(*b*) Body weights 4-5 pounds	3.4	2.2	2.2
Incidence of digestive syndromes, percentage	21.1	22.9	11.6
Severity of digestive syndromes, percentage *	17.1	18.3	8.4
Weekly gains in weight in percentage of body weight	5.6	5.4	11.0
Net death rate, percentage †			
(*a*) Acute and chronic infections	26.5	9.7	0.0
(*b*) All causes	28.9	14.5	0.7

* Evaluated by the incidence and duration of syndrome in infant-weeks.
† Excluding cases with multiple congenital anomalies incompatible with life and also death occurring within forty-eight hours after admission to the hospital.

AIR CONDITIONING IN ALLERGIC DISORDERS

Usefulness and Limitations.—The use of pollen-free air for relieving symptoms of hay fever and pollen asthma is credited to Storm Van Leeuwen.[17] He obtained pure air from the top of a shaft 30 meters high; he then cooled the air to —5 C. in order to condense out microdroplets and finally reheated it to a comfortable temperature in a specially constructed room where patients were exposed.

In the past ten years, various kinds of filters have been tried with results that are comparable to those secured by desensitization treatment, so long as the patients remained in a pollen-free atmosphere.[18] Filtration and other air-conditioning methods will never replace medical treatment, because they are not preventive but give only temporary relief; the symptoms recur on exposure to pollen-laden air. Moreover, only extrinsic forms of allergy are benefited by air conditioning. Patients with bacterial asthma may not respond at all and the symptoms may even be aggravated by air conditioning.

Despite these limitations, air-conditioning methods have definite advantages in the simplicity and con-

15. Blackfan, K. D.; Yaglou, C. P., and McKenzie, Katherine: The Premature Infant: A Study of the Effects of Atmospheric Conditions on Growth and on Development, Am. J. Dis. Child. **46**: 1175 (Nov., part 2) 1933.
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18. Van Leeuwen, W. S.: Allergic Diseases in Relation to Climate, Internat. Clin. **2**: 1 (June) 1927. Rappaport, B. Z.; Nelson, Tell, and Welker, W. H.: Effect of Air Filtration on Hay Fever and Pollen Asthma, J. A. M. A. **98**: 1861 (May 28) 1932. Nelson, Rappaport and Welker.[19] Gay.[20] Kendal and Weidner.[19] Rappaport, Nelson and Welker.[18] Criep and Green.[20]

venience of treatment. Hay fever patients are usually relieved of most of their symptoms within an hour's exposure to filtered air.[19] Relief to patients with pollen asthma comes slower, depending on the severity of symptoms.[20]

A pollen-free atmosphere is especially valuable when medical methods are not entirely successful or when desensitization is not advisable owing to concurrent illness. It offers a good means for diagnosing sensitivity, as the failure of the asthmatic to obtain relief in such a room would exclude pollens as the cause.[21]

Nonseasonal asthma is sometimes attributed to sensitization to house or street dust,[22] odors and irritating gases [23] or to any stimulus capable of exciting the vagus system of allergic individuals to activity.[24]

Suitable Air Conditions.—Although the chief remedial factor in the treatment by conditioned air appears to be filtration of pollens, there is considerable evidence that heat or cold, direct drafts, and particularly sudden temperature changes are important in initiating or aggravating asthmatic attacks.[25] It is often stated in the literature that heat regulation in asthmatic individuals is likely to be unstable, with a tendency to hypothermia. Humidity may benefit a few [26] but aggravates the condition in the majority of cases.[27]

In the experience of Rappaport, Nelson and Welker,[28] temperatures between 76 and 82 F. in warm weather with relative humidities about 30 per cent were found more comfortable to patients than lower temperatures with high humidities. Still uninvestigated is the connection between thunderstorms and attacks of pollen asthma in symptom-free patients who lived in a pollen-free and comfortable atmosphere. Changes of barometric pressure or ionization are suspected but not as yet proved.[28]

Methods of Filtering Pollens from the Air.—Paper and cloth filters of suitable area proved quite satisfactory in removing all but traces of pollens (from 95 to 99 per cent). Allergens may also be removed by electrostatic precipitation [29] and by passing the air through a suitable water spray, or over cooling coils kept at a temperature low enough to cause precipitation of nuclei on the surface of the coils.

Inexpensive filter units are now available for home or office use, with or without cooling. In the simplest type, which fits in the window like an extension screen, outdoor air is drawn in by means of a small fan and passed through a fine cloth filter before diffusing into the room. All other windows in the room are kept shut. There are also masks which fit tightly over the nose and mouth and in this way remove pollens from the inspired air. For best results, some method of cooling and dehumidification is desirable in warm weather.

AIR CONDITIONING IN FEVER THERAPY

The therapeutic possibilities of artificial fever have been reviewed recently by Hench,[30] Desjardins,[31]

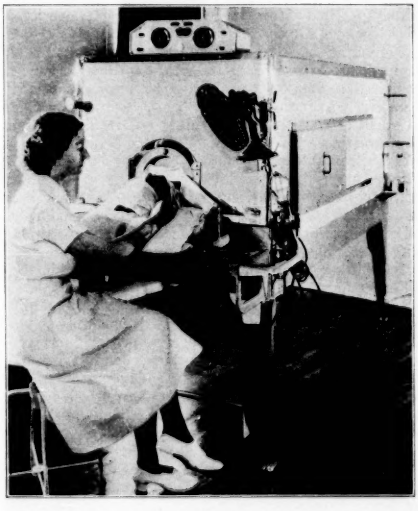

Fig. 1.—The Kettering hypertherm (Courtesy Walter M. Simpson, M.D., Miami Valley Hospital, Dayton, Ohio).

Metz,[32] Bierman [33] and others. Many diseases have been treated, in the past four years, with various degrees of success. The greatest field appears to be in the treatment of acute and chronic gonorrhea, since the specific pathogenic organisms involved can be killed by heat [34] within the limits of tolerance of man (from 105 to 107 F.). Lately, fever therapy has appeared to be of value in the management of painful neuritic states in

19. Nelson, Tell; Rappaport, B. Z., and Welker, W. H.: The Effect of Air Filtration on Hay Fever and Pollen Asthma, J. A. M. A. **100:** 1385 (May 6) 1933. Kendal, T. A., and Weidner, G.: Observations of Hay Fever Sufferers in Air-Conditioned Rooms and the Relationship Between the Pollen Content of Outdoor Air and Weather Conditions, Tr. Am. Soc. Heat. & Ventil. Engrs. **40:**229, 1934. Rappaport, Nelson and Welker.[18] Gay.[20] Rappaport, Nelson and Welker.[28] Criep and Green.[29] Trasoff and Blumstein.[30]

20. Gay, L. M.: The Treatment of Hay Fever and Pollen Asthma by Air-Conditioned Atmosphere, J. A. M. A. **100:** 1382 (May 6) 1933. Trasoff, Abraham, and Blumstein, George: The Value of Air-Conditioned Rooms in the Treatment of Seasonal and Perennial Asthma, J. Lab. & Clin. Med. **22:** 147 (Nov.) 1936. Van Leeuwen.[35] Rappaport, Nelson and Welker.[28] Nelson, Rappaport and Welker.[37] Rappaport, Nelson and Welker.[28]

21. Kahn, I. S., and Grothaus, E. M.: The Antigen-Free Room in the Detection and Control of Cutaneous Allergy in Pollen Bronchial Asthma, J. Allergy **5:** 45 (Nov.) 1933. Van Leeuwen.[35] Trasoff and Blumstein.[30]

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23. Vaughan, W. T.: Allergy and Applied Immunology, St. Louis, C. V. Mosby Company, 1931. Dowling, H. F.: Asthma Following Prolonged Exposure to Sulfur Dioxide: Report of a Case, M. Ann. District of Columbia **6:** 229 (Oct.) 1937. Feinberg and Aries.[24]

24. Feinberg, S. M., and Aries, P. L.: Asthma from Food Odors, J. A. M. A. **98:** 2280 (June 25) 1932.

25. Salter, H. H.: On Asthma: Its Pathology and Treatment, London, 1864. Duke, W. W.: Asthma, Hay Fever, Urticaria and Allied Manifestations of Reactions, St. Louis, C. V. Mosby Company, 1925; Clinical Manifestations of Heat and Effort Sensitiveness and Cold Sensitiveness, J. Allergy **3:** 257 (March) 1932. Vaughan.[23]

26. Parlato, S. J.: Deficiency of Atmospheric Humidity as a Contributing Factor in Prolonged Asthma, J. Allergy **8:** 566 (Sept.) 1937.

27. Feinberg, S. M.: Allergy in General Practice, Philadelphia, Lea & Febiger, 1934.

28. Rappaport, B. Z.; Nelson, Tell, and Welker, W. H.: The Effect of Low Relative Humidity at Constant Temperature on Pollen Asthma, J. Allergy **6:** 111 (Jan.) 1935.

29. Criep, L. H., and Green, M. A.: Air Cleaning as Aid in Treatment of Hay Fever and Bronchial Asthma, J. Allergy **7:** 120 (Jan.) 1936.

30. Hench, P. S.: Clinical Notes on the Results of Fever Therapy in Different Diseases, Report of Fifth Annual Fever Convention, Dayton, Ohio, May 1935, Proc. Staff. Meet., Mayo Clin. **10:** 662 (Oct. 16) 1935.

31. Desjardins, A. U.; Stuhler, L. G., and Popp, W. C.: Fever Therapy for Gonococcic Infections: II, J. A. M. A. **106:** 690 (Feb. 29) 1936.

32. Metz, M. H.: Results Obtained by the Use of Fever Therapy, J. A. M. A. **106:** 1658 (May 9) 1936.

33. Bierman, William: Fever Therapy, Arch. Phys. Therapy **18:** 28 (Jan.) 1937.

34. Boak, Ruth A.; Carpenter, C. M., and Warren, S. L.: The Thermal Death Time of 130 Strains of Neisseria Gonorrhoeae, Proc. Fifth Annual Fever Therapy Conf., Dayton, Ohio, May 1935. Desjardins, Stuhler and Popp.[31]

which heretofore no single procedure has given satisfactory relief. Bennett and Cash [35] present extensive clinical evidence on the relief of painful neuritic meningitic and radicular states with systemic fever at 103-105 F. in treatments of two to three hours each, from two to six treatments altogether.

Since 1918, when Wagner von Jauregg introduced malaria therapy as a means of producing artificial fever, various other methods have been tried, including injection of vaccines, colloid or crystalloid substances, and various physical means, such as hot baths, radiant heat, diathermy, radiothermy, heat blankets and air-conditioned cabinets. The relative advantages and limitations of these methods were recently discussed by Doub [36] and by Desjardins, Stuhler and Popp.[31] Although comparable results may be obtained with most of these methods, the air-conditioned cabinets are believed to offer a safer and more effective means, by permitting more accurate control of temperature and by reducing the hazards inherent to certain other methods. Some workers have secured better results by combining systemic fever with chemotherapy or with additional local heating by diathermy or other means than by the use of heat cabinets alone.

Simpson [37] described the first practical heat cabinet for hospital use, known as the "Kettering hypertherm." Briefly, it consists of an insulated cabinet about 6 feet long, 3 feet wide and 2½ feet high, equipped with electric heating and humidifying apparatus. Hot air at from 130 to 150 F. and from 30 to 50 per cent relative humidity is circulated to the patient's compartment at the rate of 425 cubic feet per minute by means of a centrifugal fan. The temperature and humidity are automatically controlled by the setting of a knob and their values are indicated conspicuously on large dials with warning pilot lights on the front end of the cabinet. The nude patient lies on an air mattress with his head protruding outside the front end of the cabinet through a rubber collar (fig. 1). Any degree of fever can be induced quickly or slowly and maintained as long as desired according to individual requirements. Simpson finds that the body temperature rises to 105 F. in forty to sixty minutes. Water and chlorides lost in the sweat are replaced by mouth during the treatment.

In the past three years, several heat cabinets have appeared with some improvements. Probably the most important improvement is the substitution for hot dry air of nearly saturated air at a comparatively low temperature. In this way burns of the skin are eliminated, the loss of water and chloride may be less,[38] and the room in which the hypertherm is located is not heated as much as when hot dry air is used.

It can be seen in figure 2 that with a relative humidity of 30 per cent it would take too long to raise the body temperature 6 degrees F. (from 99 to 105) without resorting to excessively high air temperatures. With 60 per cent relative humidity and air movement of 400 feet per minute over the body, a temperature of about 120 F. will raise the body temperature 6 degrees in one hour, whereas with saturated air the cabinet temperature need only be from 106 to 107 F. These values will vary in different individuals and in different diseases.

Few data are available on the combinations of temperature and humidity required to maintain the body at various fever temperatures after initial heating. With saturated air a temperature of about 100 F. appears to be sufficient to keep the body at 105.

Extensive work in fever therapy is continuing on a wide variety of pathologic conditions. While this form of therapy is rapidly gaining wide recognition, its application, according to the American Medical Association, "should remain strictly a hospital procedure surrounded with the safeguards commonly employed in a major operation and under the direction of skilled physicians." The dangers associated with fever therapy were disclosed in recent papers by Kopp and Solomon,[39] Hartman [40] and others.

AIR CONDITIONING IN OXYGEN THERAPY

Excellent reviews of the underlying physiologic principles of oxygen therapy and its value in various diseases have been written recently by Boothby,[41] Potts [42] and Barach.[43]

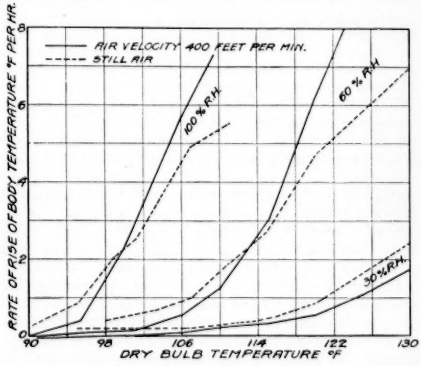

Fig. 2.—Rise of body temperature (rectal) in a group of norman men after one hour's exposure in an air-conditioned room (after McConnell, W. J., and Yaglou, C. P.: Air Motion, High Temperatures and Various Humidities: Reaction on Human Beings, Tr. Am. Soc. Heating and Ventilating Engineers **30**: 167, 1924; coutresy American Society of Heating and Ventilating Engineers).

Oxygen Tents.—In oxygen tents, or chambers, air conditioning is concerned with the conservation of expensive oxygen gas by removal of excessive heat, moisture and carbon dioxide, in a closed space in which there is no outside air supply other than that from leakage.

In tents, the cooling medium is usually ice. A small motor blower circulates the air over soda lime to remove carbon dioxide and then over ice for cooling and dehydration. The concentration of oxygen is regulated by means of a pressure-reducing valve and flowmeter. The usual rate of flow is from 5 to 10 liters per minute in tight tents, and the usual oxygen concentration is

35. Bennett, A. E., and Cash, P. T.: Relief of Neuritic Pain by Artificial Fever Therapy, Arch. Phys. Therapy **19**: 69 (Feb.) 1938.

36. Doub, H. P.: Artificial Fever as a Therapeutic Agent, Radiology **25**: 360 (Sept.) 1935.

37. Simpson, W. M.: Artificial Fever Therapy of Syphilis, J. A. M. A. **105**: 2132 (Dec. 28) 1935.

38. Lee, D. H. K., and Mulder, A. G.: Some Immediate Effects of Reduced Cooling Powers upon the Water Balance and Related Effects in the Human Subject, J. Physiol. **84**: 410 (July 24) 1935.

39. Kopp, Israel, and Solomon, H. C.: Shock Syndrome in Therapeutic Hyperpyrexia, Arch. Int. Med. **60**: 397 (Oct.) 1937.

40. Hartman, F. W., and Major, R. C.: Pathological Changes Resulting from Accurately Controlled Artificial Fever, Am. J. Clin. Path. **5**: 392 (Sept.) 1935. Hartman, F. W.: Lesions of the Brain Following Fever Therapy: Etiology and Pathogenesis, J. A. M. A. **109**: 2116 (Dec. 25) 1937.

41. Boothby, W. M.: Oxygen Therapy, J. A. M. A. **99**: 2026 (Dec. 10), 2106 (Dec. 17) 1932.

42. Potts, W. H., Jr.: Oxygen Therapy: A Critical Résumé, Am. J. M. Sc. **184**: 616 (Nov.) 1932.

43. Barach, A. L.: Recent Advances in Inhalation Therapy in the Treatment of Cardiac and Respiratory Disease, New York State J. Med. **37**: 1095 (June 15) 1937.

50 per cent or less. Temperatures down to 75 F. and humidities between 40 and 50 per cent are approximately the limits of the equipment in warm weather.

Oxygen Chambers.—Oxygen chambers were introduced by Barcroft, Hunt and Dufton [44] in England and by Stadie [45] and Binger [46] in America. The conventional chamber is made of sheet steel and is large enough to accommodate one or two beds. All entrances

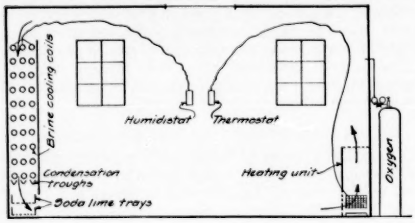

Fig. 3.—Line drawing of a conventional oxygen chamber with gravity air circulation.

are provided with trap doors to avoid loss of oxygen. Illumination comes through a glass window in the ceiling. The conditioning system is either the gravity type first used by Barach [47] or the fan type using silica gel and mechanical refrigeration. Circulation in the gravity type is induced by means of a heating coil and a cooling coil on opposite walls (fig. 3), the former regulating the temperature, and the latter the humidity with automatic controls. Soda lime at the bottom of the cooling coils removes excessive carbon dioxide. The main objections to gravity circulation are stratification of cold air near the floor and accumulation of odors.

In the fan-circulation system (fig. 4) moisture is absorbed in silica-gel beds and the air is cooled by compact finned coils through which cold brine is circulated. Spray dehumidifiers are unsuitable for this purpose because the air must be cooled often below 32 F. in order to obtain relative humidities well below 30 per cent, for the treatment of pneumonias and bronchial conditions.

The factors which determine the selection of proper temperature and humidity in oxygen therapy are primarily individual; the patient rather than the disease is given first consideration. For pneumonias, Bullowa [48] and Barach [49] place the desirable temperature range between 60 and 75 F., with relative humidities between 20 and 50 per cent. The consensus favors as low a humidity as is consistent with economy.

Oxygen chambers are more comfortable than oxygen tents, particularly to the restless and delirious types of patients. Nursing and medical care is unhampered and oxygen concentration, temperature and humidity can be accurately controlled at any desired level.

The main disadvantage is high initial and operating costs in comparison with tents and other simpler methods. The cost may be justified in large hospitals and for research purposes, but for routine oxygen therapy alone conventional metal chambers have proved to be a liability rather than an asset, because they are not used continuously and cannot be used for anything else.

There is no reason why an ordinary room cannot be made fireproof and reasonably airtight without expensive metal construction. In addition to pneumonias and respiratory and heart disorders, many diseases affected by heat, cold, humidity or chemical constitution can be taken care of in one or two such rooms without serious difficulties in the design of air-conditioning apparatus. The rooms can also be used as ordinary wards with or without running the conditioning apparatus, when they are not needed for special treatment.

GENERAL HOSPITAL AIR CONDITIONING

Complete conditioning of large hospitals is much too expensive in initial and operating costs to be justified on the basis of any available evidence.

In the cold season of the year, the requirements of almost all general and private wards can be satisfactorily fulfilled by rational heating in conjunction with window ventilation and gravity or mechanical exhaust. Insulation for heat and sound is very important. Excessive outside dust and noise may be controlled by the use of suitable air filters and silencers in the window openings. The preferred method of heating is by hot water with radiators under the windows extending the entire length of the window. The preferred exhaust system in large buildings consists of one or more fans installed in the attic or in a penthouse on the roof. One or more vertical shafts connect the fan or fans with trunk ducts on the ceiling of each floor, and the exhaust openings in individual rooms communicate with these trunk ducts.

Cooling in warm weather deserves serious consideration, particularly in the South and Middle West. High cost precludes cooling the entire hospital, but the needs

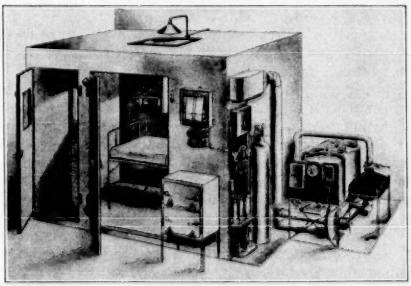

Fig. 4.—A one-patient oxygen chamber of the fan-circulation type, using silica gel for dehydration (courtesy Silica Gel Corporation).

of the average hospital may be satisfactorily fulfilled by the use of built-in room coolers in certain sections of the hospital and a few portable units which can be wheeled from ward to ward when needed. In the past few years, these units have been improved so that they are now less noisy, easier to move and less costly. From the standpoint of noise and cost there are definite advantages in multiple built-in units furnished with refrigerant from one or more central compressors in the basement.

44. Barcroft, J.; Hunt, G. H., and Dufton, D.: Treatment of Gas Poisoning by Continuous Oxygen Administration in Chambers, Quart. J. Med. **13**: 179 (Jan.) 1920.
45. Stadie, W. C.: Construction of an Oxygen Chamber for the Treatment of Pneumonia, J. Exper. Med. **35**: 323 (March) 1922.
46. Binger, C. A. L.: Construction and Management of an Oxygen Chamber, Mod. Hosp. **24**: 186 (Feb.) 1925.
47. Barach, A. L.: New Oxygen Chamber Ventilated by Thermal Circulation of Air, Mod. Hosp. **32**: 144 (Jan.) 1929.
48. Bullowa, J. G. M.: General Measures Employed in the Treatment of the Pneumonias, Health Examiner **5**: 12, 1936.
49. Barach, A. L.: A New Type of Oxygen Chamber, J. Clin. Investigation **2**: 463 (Aug. 20) 1926.

Cooling in warm weather is of great value in maternity and delivery rooms, children's wards, x-ray rooms, and in the treatment of fevers, heat stroke, heart failure, enteric disorders and a number of other ailments that accompany summer heat waves.

A more thorough description of air-conditioning apparatus for hospitals, including initial and operating costs, is given in a Report of the American Hospital Association.[50]

The operation of hospital air-conditioning plants is as important as the installation. Unless they are kept clean and are serviced periodically by competent engineers, they will not prove satisfactory in the hands of inexperienced hospital engineers.

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Council on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED.

FRANKLIN C. BING, Secretary.

SWISS BRAND EVAPORATED MILK

Manufacturer.—Ewing-Von Allmen Dairy Company, Louisville, Ky.

Description.—Canned, unsweetened, evaporated milk.

Manufacture.—Carefully selected milk is collected, shipped to the main plant in insulated tank trucks, pumped into storage tanks, cooled to 40 degrees, preheated, and held at 95 to 99 C. for thirty minutes. The milk is partially evaporated under vacuum, homogenized, standardized, cooled, filled into cans and sterilized.

Analysis (submitted by manufacturer).—Moisture 74.1%, total solids 25.9%, ash 1.5%, fat (ether extract) 7.9%, protein (N × 6.38) 7.3%, lactose (by difference) 9.2%.

Calories.—1.4 per gram; 40 per ounce.

DROMEDARY BAKED APPLES

Manufacturer.—Hills Brothers Company, New York.

Description.—Canned baked apples packed in syrup of granulated cane sugar, water and honey.

Manufacture.—Carefully selected and graded York Imperial apples are cored and the skin punctured by machine, again inspected and any remaining core, seeds and blemishes removed. The apples are washed, baked for forty-five minutes, placed in individual waxed paper cups, packed in tins, covered with hot syrup, sealed, processed and cooled.

Analysis (submitted by manufacturer).—Moisture 67.1%, total solids 32.9%, ash 0.3%, fat (ether extract) 0.4%, protein (N × 6.25) 0.7%, crude fiber 0.7%, carbohydrates other than crude fiber (by difference) 30.8%, sucrose 2.4%, reducing sugars as dextrose 28.8%.

Calories.—1.3 per gram; 37 per ounce.

NUTRADIET BRAND WHOLE RED BEETS PACKED IN WATER

Distributor.—The Nutradiet Company, a subsidiary of S & W Fine Foods, Inc., San Francisco.

Description.—Canned whole beets, packed in water without added sugar or salt.

Manufacture.—Properly matured Detroit Dark Red Beets are graded and stored for one to three days to set the color, are inspected and hand topped, blanched, mechanically peeled in a stream of water, graded and packed by hand in enamel-lined tins. Boiling water is added and the containers are exhausted, sealed and processed.

Analysis (submitted by manufacturer).—Moisture 81.7%, total solids 18.3%, ash 0.5%, fat (ether extract) 0.1%, protein (N × 6.25) 0.7%, crude fiber 0.5%, carbohydrates other than crude fiber (by difference) 16.5%.

Calories.—0.70 per gram; 20 per ounce.

Claims of Manufacturer.—For use in special diets in which sugar or salt is proscribed or in quantitative diets of calculated composition.

ANDERSON'S WHEAT GERM

Distributor.—Mrs. Catherine S. Anderson, Grosse Pointe, Mich.

Manufacturer.—Pillsbury Flour Mills Company, Minneapolis.

Description.—Wheat embryo as obtained from the milling of hard wheat.

Manufacture.—Select hard red spring and hard red winter wheat are cleaned, scoured, tempered and milled by essentially the same procedure as described in THE JOURNAL, June 18, 1932, page 2210. The germ is separated from the first break middlings, flaked on suitable rolls, freed from impurities on a special sifter and packed by hand. The Pillsbury Laboratory reports that the finished product is composed of about 85 per cent germ, 10 per cent bran and 5 per cent endosperm.

Analysis (submitted by manufacturer).—Moisture 6.0%, total solids 94.0%, ash 4.5%, fat (ether extract) 12.3%, protein (N × 5.7) 30.6%, sucrose 16.3%, reducing sugar as dextrose 1.2%, crude fiber 2.5%, carbohydrates other than crude fiber (by difference) 44.1%.

Calories.—4.1 per gram; 116 per ounce.

Vitamins.—Reports of assays show 3,600 International units (4,788 Sherman units) of vitamin B_1 per pound and 1,816 Bourquin-Sherman units of vitamin G per pound.

LARSEN'S BRAND STRAINED APPLES AND APRICOTS

Manufacturer.—The Larsen Company, Green Bay, Wis.

Description.—Canned, sieved apples and apricots.

Manufacture.—Selected fresh apples are cored, chopped and combined with canned fresh apricots, mixed, softened, double screened under vacuum, and filled into cans which are sealed in vacuum and processed for sixty minutes at 212 F.

Analysis (submitted by manufacturer).—Moisture 81.7%, total solids 18.3%, ash 0.6%, fat (ether extract) 0.2%, protein (N × 6.25) 0.8%, crude fiber 0.7%, carbohydrates other than crude fiber (by difference) 16.0%, calcium (Ca) 0.013%, phosphorus (P) 0.055%, iron (Fe) 0.0012%, ratio calcium/phosphorus 0.24%, ratio carbohydrates/protein 20%.

Calories.—0.7 per gram; 20 per ounce.

MRS. PALEY'S BABY FOOD—STRAINED APRICOTS

Manufacturer.—Paley-Sachs Food Company, Houston, Texas.

Description.—Cooked, sieved, sulfured dried apricots, packed with added dextrose.

Manufacture.—Dried, sulfured apricots are washed, soaked for twelve hours, pressure cooked with added dextrose, sieved, filled into glass jars, vacuum sealed and heat processed.

Analysis (submitted by manufacturer).—Moisture 70.4%, total solids 29.6%, ash 1.1%, fat (ether extract) 0.1%, protein (N × 6.25) 1.1%, reducing sugars as dextrose 10.3%, sucrose 10.8%, crude fiber 0.9%, total carbohydrates other than crude fiber (by difference) 26.4%, calcium (Ca) 0.024%, phosphorus (P) 0.048%, iron (Fe) 0.0023%, sulfur dioxide (SO_2) 0.0211%.

Calories.—1.1 per gram; 31 per ounce.

50. Report of the Committee on Air Conditioning, Bull. 119, Am. Hosp. A., 1934.

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THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JUNE 11, 1938

THE LYMPHATIC SYSTEM

In his Harvey lecture, last year, C. K. Drinker [1] of the Harvard School of Public Health reviewed our knowledge of the functional significance of the lymphatic system. Of all mammals man can probably claim the most extensive and elaborate lymphatic apparatus. One of the principal functions of this system is defense against inflammatory processes, but this is not the whole story. The study of lymphatic function under normal conditions has already yielded information of additional import. The lymphatics are a simple subsidiary circulatory mechanism and are steadily engaged in moving fluid which leaves the blood capillaries and returns again to the blood. In a series of experiments begun in 1930 in Professor Krogh's laboratory, lymph was collected from different regions in the dog. The most dependable figure on the amounts of lymph collectable per minute (exclusive of the thoracic duct and abdominal vessels) were obtained by cannulating the lymph in the foreleg of a dog under local anesthesia. Fluid equal to fifty times the total blood plasma may leave the capillaries and pass through the lymphatic system in twenty-four hours. Furthermore, it was found from analysis of the chemical and physical properties that lymph is essentially a reflection of the composition of the blood plasma after allowance for dilution. In the light of modern experiment, therefore, it appears that in mammals such blood proteins as leave the capillaries to enter the tissue fluid are removed by the lymphatics. Under normal circumstances this function is called into play by such factors as changes in position, movement and tissue pressure. The composition of lymph is due to the filtration of products from the blood and not, as has been suggested, to the universal production of this fluid in the tissues.

Further information on the functions of this system was obtained by Drinker and his co-workers in a series of ingenious experiments begun in 1932. These were based on the ablation of lymphatic function in a part. The conclusions as to what is normal were dependent on what failed to happen when such lymphatics were rendered functionless. Repeated centrally directed injections of a suspension of finely divided crystalline silica in 2.5 per cent quinine hydrochloride were used. In this mixture the quinine caused a painless necrosis of the tissues and the silica induced progressive fibrosis. In this manner lymphedema was produced, followed by fibrosis, overgrowth, typically elephantiac change and eventually epithelial proliferation in the foot pads. The second definite result was the appearance of an astonishing susceptibility to streptococcic infections. In addition to these factors, the isolated limb subject to experiment at once began to grow and the growth was wholly at the site of fluid accumulation; that is, in the skin and subcutaneous tissues. The tissue fluid gained steadily in protein until concentrations as high as 5 per cent were reached. These regions became for the first time susceptible to infection not only with the streptococcus but with other organisms as well.

Drinker believes that the lymphatic system retains its primitive position as part of the circulatory apparatus. Because the permeability of peripheral blood capillaries to protein is not quantitatively great, this function is overlooked until lymph drainage becomes important in the presence of spreading infection, edema or elephantiasis.

Lymph nodes represent a portion of the lymphatic apparatus that is particularly puzzling. They are effective filters; it is questionable whether any extravascular protein can get back to the blood vessels without going through a lymph node. Lymph flowing to a node from a number of afferent vessels reaches the marginal sinus and is there in a relatively large umbrella-shaped lake where the rate of flow becomes exceedingly slow and opportunity for settling occurs. This mechanical effect is supplemented by the biologic actions of endothelial phagocytes in the lymph node reticulum. These two effects are particularly well devised for impeding bacterial growth and spread. Therefore, even relatively huge doses of organisms entering through the afferent lymphatics escape from the node with difficulty if at all. If the infection is so overwhelming, however, that actual lymph node infection is established, the node may act as a nidus to feed organisms steadily into the lymph stream.

Another function of the nodes is to pour lymphocytes into the lymph stream, and this activity can be augmented by massage of a node.

Slowly the increasing availability of direct methods of experiment on this interesting system is adding to the sum of physiologic knowledge. The experimental methods available today indicate that this circulatory system will be slowly taken to pieces physiologically and analyzed just as has been the case with the blood circulatory system.

1. Drinker, C. K.: The Functional Significance of the Lymphatic System, Bull. New York Acad. Med. **14**: 231 (May) 1938.

COLLAPSE THERAPY FOR PULMONARY TUBERCULOSIS IN OLDER PATIENTS

Collapse therapy for pulmonary tuberculosis has become, in the last two decades, a most important measure in combating this disease. Various methods of accomplishing collapse of the lung, as well as the indications for each, have been established. With the improvement in the technic and in the results obtained, the indications have widened to include a greater number of cases. Although collapse of the lung was at first considered suitable only for unilateral cases, it is now regarded as applicable under certain conditions to bilateral cases as well.

Decker,[1] in a recent communication, raises the question of the age limit, more specifically, the question of the benefits to be gained from surgical procedures in patients past 40 years of age. He presents an analysis of a group of patients whose ages ranged between 40 and 60 years. About 25 per cent of the cases were moderately advanced and the remainder far advanced. About half of the patients had bilateral lesions. Cavities were present in 106 (69 per cent). Here was a group of patients largely incapacitated for work, dependent on their families or institutions for support, and with no other outlook than invalidism and death from the disease. They were submitted to various forms of collapse therapy. The clinical results observed for periods ranging from six months to ten years suggest that about 20 per cent of this group will ultimately be well, perhaps able to do some work, that 25 per cent will be improved, that 25 per cent will remain unimproved and will die of the disease, and that 30 per cent have already died or soon will die. A comparison with the results in the age group of 20 to 40 years, according to Decker, showed a difference of from 10 to 15 per cent in less favorable response.

The least violent of the surgical methods, namely, artificial pneumothorax, was much less satisfactory in its effects than might have been expected. The method was tried in seventy-eight cases and the treatment was continued for periods of from three months to six years. It was carried to completion in 20 per cent and was discontinued because of unsatisfactory collapse in 15 per cent and for other reasons in 35 per cent. Arrest was obtained in 16.6 per cent, improvement in 24.5 per cent, no benefit in 32 per cent and mortality in 26.9 per cent. The failure to induce a sufficient degree of collapse in these cases is due to the greater frequency of adhesive pleuritis. The most satisfactory results were obtained with phrenic nerve exeresis. Of the seventy-three operations performed, eighteen resulted in arrest and thirty-three in improvement. Fixation of the diaphragm was obtained in all. Cavities were closed in 15 per cent. Results with thoracoplasty were anything but encouraging. Of seventeen patients submitted to thirty-four operations, eight, or 47.2 per cent, died. Among the contributing causes the author considers the lowered vitality, extensive pleural adhesions, fibrosis and emphysema in the contralateral lung, arterial sclerosis, greater tendency to postoperative nephritis and beginning degenerative changes in the myocardium.

Because of the generally hopeless outlook of this group, they should be given whatever benefit they may derive from collapse therapy. Apparently indications for thoracoplasty must be even more strictly limited rather than extended.

1. Decker, H. R.: Experience with Collapse Therapy for Pulmonary Tuberculosis in the Fifth and Sixth Decades, J. Thoracic Surg. **7**: 351 (April) 1938.

CIRCULATION OF BILE AND SYNTHESIS OF HEMOGLOBIN

A continuous cycle of secretion and absorption of bile from the intestinal tract is apparently necessary for normal synthesis of hemoglobin. This conclusion by Hawkins and his co-workers[1] of the Department of Pathology, University of Rochester School of Medicine, is drawn from a continuation of their studies of experimental bile fistula in dogs. By the fistulas which they establish the bile is drained into the right renal pelvis. From earlier studies they found that exclusion of bile from the intestinal tract by this technic led to several abnormalities. First was the development of general osteoporosis, often leading to spontaneous fractures. Physiologic analysis showed that this abnormality of bone was caused by lack of absorption of vitamin D from the intestinal tract. The lesion in bone could be prevented by the oral administration of bile. A second abnormality of major importance was a tendency to purpura, often leading to spontaneous bleedings. Analysis showed that this bleeding was due to lack of prothrombin in the blood plasma. Here also the lesion could be prevented by adequate feeding of bile.

In order to study the effects of bile fistula on the formation of blood pigment the Rochester pathologists combined experimental bile fistula with experimental anemia. The anemia was produced by repeated withdrawals of relatively large amounts of blood. In the anemic dogs with bile fistula the rate of hemoglobin regeneration was but about half that in their control anemic dogs with normal circulation of bile. Iron given by mouth was utilized at but half the rate of its utilization in control anemic dogs. Colloidal iron injected intravenously, however, was therapeutically effective in both groups. Apparently dogs with bile fistula are able to absorb iron from the intestinal tract at only about half the normal rate. Unlike the reduced

1. Hawkins, W. R.; Robscheit-Robbins, F. S., and Whipple, G. H.: J. Exper. Med. **67**: 89 (Jan.) 1938. Hawkins, W. B., and Whipple, G. H., ibid. **62**: 599 (Oct.) 1935. Hawkins, W. B., and Brinkhous, K. M., ibid. **63**: 795 (June) 1936.

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absorption of vitamin D, however, the rate of iron absorption could not be increased by the oral administration of bile.

The fact that dogs with bile fistula can be maintained at a normal body weight over a period of years indicates adequate absorption of protein digestive products. The failure of oral administration of bile to compensate for this reduced absorption of iron seems to suggest the existence of labile hormones or enzymes in freshly secreted bile. Perhaps this "ferrosynthesin" is destroyed or denatured by routine methods of preparation and oral administration of bile. Such a hypothetic enzyme might conceivably be necessary not only for adequate absorption of iron from the intestinal tract but after absorption as a hepatic stimulant or chemical precursor in synthesis of hemoglobin. The Rochester pathologists, however, wisely refrain from all theoretic speculations of this type and limit themselves to modest conclusions: (1) that a constant secretion and absorption of bile from the intestinal tract is necessary for a normal rate of iron metabolism, and (2) that lack of adequate bile circulation cannot be compensated for by the oral administration of bile. Iron given by mouth is only partially effective.

SCARLET FEVER QUARANTINE

From two state boards of health come announcements indicating changes in the quarantine regulations for scarlet fever. The Oregon State Board of Health [1] promulgates a modification of scarlet fever quarantine, with the statement that it "has found it necessary to require more rigid measures to prevent this disease from spreading."

At the same time the Iowa State Department of Health [2] announces a liberalization of quarantine to the extent of permitting the breadwinner to enter and leave a quarantined home in which there is a case of scarlet fever "provided he is not a food handler, does not come in contact with the patient or with groups of children and gives satisfactory evidence of immunity to the disease. However, if he handles dairy products or ready-to-eat foods, the breadwinner or other adult should live elsewhere while the home is placarded and not resume employment until from three to seven days after last exposure. This arrangement also applies to teachers and others who come in contact with children."

Here are two diametrically opposite actions, each taken by a state health organization of competence and experience.

The Oregon State Board of Health permits release after twenty-one days from the time when the case has been reported, provided there are no evidences of infectiousness and provided negative cultures of the nose and throat have been obtained. According to the Iowa announcement, the minimum period of isolation is also twenty-one days, but in this case "from the day of onset of illness." As to cultures of the nose and throat, the Iowa announcement states, "in some instances it may be advisable for a public health laboratory to report on the presence or absence of the scarlet fever germ."

Since the adoption of modern methods of control of contagious disease, scarlet fever has created the most vexing problems in epidemiology which confront the physician and the public health officials. The difficulty begins with diagnosis; many atypical cases without rash or sore throat, of doubtful type, and strawberry tongues without diagnostic significance add to the difficulties of recognition. The missed and mild cases and healthy carriers are undoubtedly responsible for epidemics more than is the frank case of the disease, especially if the patient is severely ill. Once quarantine has been established, the question of termination is immediately raised. Quarantine periods have ranged all the way from a minimum of twenty-one days to a minimum of forty-two days, with twenty-eight days a common intermediate figure. The utmost difficulty is always experienced in persuading quarantined persons that the number of days is a minimum and not a maximum. In mild cases in which apparent recovery may take place as early as the seventh or tenth day, or in extremely mild cases in which the child is scarcely ill, the utmost resistance is encountered to a minimum of even twenty-one days. The culturing of throats for hemolytic streptococci is less satisfactory than culturing for diphtheroid organisms because of the difficulties inherent in distinguishing the strains of the hemolytic streptococcus, and the absence of a relatively easy virulence test to settle problems of prolonged quarantine. If the health officer liberalizes quarantine and an outbreak follows, he may erroneously be blamed for what was in no way related to the official action. If he tightens his regulations to assist in the control of a threatened outbreak, he is faced with the problem of evasions and nonreporting.

Scarlet fever has apparently grown milder, if one may judge by reported death rates. This may be a reflection of modern hospital and nursing care, of such immunization as has been done, and of the use of serum therapy in severe cases. It may, however, be due merely to a zymotic cycle. The problem of scarlet fever is far from solved. What is needed more than anything else is a laboratory technic for the quick and inexpensive diagnostic culturing of hemolytic streptococci of the scarlet fever strains, and extensive observations in the field to observe the effects of release on the basis of negative cultures.

1. Weekly Bulletin, Oregon State Board of Health **16**, March 15, 1938.

2. Weekly Health Message, United States Public Health Service in Cooperation with the Iowa State Department of Health, No. 596, March 14, 1938.

Current Comment

DISTRIBUTION OF HOSPITAL SERVICE

In the United States there are only five counties with a population density of five per square mile within thirty miles of which there is no registered general hospital. As vast programs of hospital construction are being advocated,[1] certain facts regarding the present distribution of hospital facilities should be kept in mind. In 1937 there were 6,128 hospitals registered by the American Medical Association with a capacity of more than a million beds and fifty-five thousand bassinets, to which well over nine million patients were admitted during the year.[2] True there are 941 counties without a registered hospital, but of these, 560, or 60 per cent, lie wholly within a thirty mile radius of hospitals in adjoining territory. There remain 368 counties parts of which are within thirty miles of existing hospital facilities and, in the whole country, but thirteen counties no part of which is within thirty miles of a registered general hospital. The population of these counties is 67,800. Eight of them support less than five persons per square mile. There may be some localities in which hospital facilities are needed. However, the Commonwealth Fund, which for the past ten years has been awarding hospitals to communities which seemed to be able to maintain such institutions with proper standards, has thus far made eleven awards.

RISK IN USING ZINC SULFATE FOR PREVENTION OF POLIOMYELITIS

About one year has passed since Schultz and Gebhardt reported that 1 per cent zinc sulfate solution applied to the olfactory mucosa in monkeys affords a high degree of protection against poliomyelitis virus instilled into the nose a month later. This method of prevention has been used experimentally in many places. The risk of producing permanent loss of the sense of smell must be considered in connection with its use. Schultz and Gebhardt (page 2024, this issue), point out that several cases have occurred in which the sense of smell has not yet returned after a period of more than six months. Cases of such lasting anosmia have not been discovered in children, however, perhaps because of anatomic differences in the nose. Schultz and Gebhardt recently observed after the application of zinc sulfate to the olfactory area of monkeys a severe exudative inflammation of the olfactory mucosa, together with desquamation of epithelial cells. Caution is advised, therefore, in the further use of zinc sulfate in man until more is known about the risk of permanent anosmia and of the mechanism underlying the protection against poliomyelitis in monkeys. The full answer to this problem cannot be obtained from experimental work on animals. Physicians will be able to help investigators by transmitting to them their individual experiences.

1. The Need for a National Health Program, Report of the Technical Committee on Medical Care, Interdepartmental Committee to Coordinate Health and Welfare Activities, Washington, D. C., 1938.
2. Hospital Service in the United States, J. A. M. A. **110**: 959 (March 26) 1938.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Symposium on Oxygen Therapy.—The Jefferson County Medical Society sponsored a symposium on oxygen therapy at a meeting in Birmingham May 16. The speakers included:

Allen D. Keller, Ph.D., professor of physiology and pharmacology, University of Alabama School of Medicine, Physiology of Oxygen Want.
J. I. Banash, B.S., consulting engineer, Chicago, Mechanical Considerations of Oxygen Therapy Apparatus.
Dr. James S. McLester, professor of medicine, University of Alabama School of Medicine, Clinical Response to Oxygen Therapy.

CALIFORNIA

Plague Infection in Squirrels. — According to *Public Health Reports*, plague infection has been proved by animal inoculation in one beecheyi squirrel from a ranch four miles east of Watsonville and in a pooled specimen of organs from five squirrels from a ranch six miles east of Watsonville, Santa Cruz County. These specimens were submitted to the Hooper Foundation for Medical Research, San Francisco, April 13.

Changes Among Health Officers. — Dr. Ellis D. Sox, Berkeley, has been appointed health officer of Tulare County; the unit has recently been placed on a full time basis. Dr. Elmo R. Zumwalt, Tulare, health officer of the unit under the old setup, continued on a part time basis until June 1. Dr. Elmer M. Bingham, San Luis Obispo, health officer of Yolo County, has been appointed to a similar position in San Luis Obispo County. He succeeds Dr. Allen F. Gillihan, who retired on account of ill health. Dr. John O. Rafferty, Oakland, has been appointed to succeed Dr. Elmer McK. Bingham, San Luis Obispo, as health officer of Yolo County. Dr. Seth H. Miles, Santa Monica, has been appointed health officer of Mono County, succeeding Dr. Robert K. Harker, Bridgeport.

CONNECTICUT

Society News.—The New Haven Medical Association was addressed April 20 by Dr. Arthur Krida, New York, on "Treatment of Fracture of the Hip."——At a meeting of the Yale Medical Society in New Haven May 11 the speakers were, among others, Abraham White, Ph.D., on "Chemical Studies of Anterior Pituitary Hormones" and Dr. Hebbel E. Hoff and Richard G. Horton, Ph.D., "Cortical Control of Cardiovascular Reflexes." A special meeting of the society was addressed May 18 at the Sterling Hall of Medicine by Dr. Herbert W. Wade, medical director, Leonard Wood Memorial, Culion, P. I., on "Leprosy as a World Problem." Dr. Wilder G. Penfield, Montreal, discussed "Circulatory Changes in the Epileptic Brain" before the society April 13.

Thirty Years of Mental Hygiene. — The Connecticut Society for Mental Hygiene observed its thirtieth anniversary at a two day celebration May 6-7 in New Haven. A founders' dinner commemorated the event May 5. Other features included a public jubilee celebration in the auditorium of the Law School of Yale University and an institute of mental hygiene at which sessions were conducted for social workers, public health nurses and teachers. At the public meeting the speakers were, among others, Gov. Wilbur L. Cross, Charles-Edward A. Winslow, Dr.P.H., president of the society; Dr. Clarence M. Hincks, New York, general director, National Committee for Mental Hygiene in the United States and medical director of the Canadian Committee for Mental Hygiene, and Mr. Clifford W. Beers, founder of the mental hygiene movement.

Dr. Yandell Henderson Retires. — Yandell Henderson, Ph.D., who has been associated with Yale University since 1900, will retire as director of the laboratory of applied physiology, Yale University School of Medicine, New Haven, at the end of the academic year, according to *Science*. He will be succeeded by Dr. Howard W. Haggard, associate professor of applied physiology, who also becomes professor. Dr. Henderson was born in Louisville, Ky., April 23, 1873. He received his degree of doctor of philosophy at Yale in 1898 and at the universities of Marburg and Munich in 1899 and 1900 respec-

tively. He joined the staff at Yale in 1900 as instructor in physiology, becoming professor of applied physiology in 1921. An Associate Fellow of the American Medical Association, he served as secretary of its Section on Pathology and Physiology in 1909-1910 and as chairman in 1910-1911.

DISTRICT OF COLUMBIA

Dr. Parran Awarded Mendel Medal.—Dr. Thomas Parran, surgeon general, U. S. Public Health Service, has been awarded the Mendel Medal for 1938 by Villanova (Pa.) College in recognition of his scientific approach to the problems of public health. The medal was established by the college in 1929 as a mark of recognition for the work of the outstanding Catholic scientist of the year.

New Officers of District Society.—Dr. John H. Lyons, Washington, was named president-elect of the Medical Society of the District of Columbia at its annual session May 11, and Dr. William J. Mallory, Washington, was inducted into the presidency. Vice presidents are Drs. William T. Gill Jr. and David Davis. Dr. Coursen B. Conklin, Washington, was reelected secretary. The next annual session will be held in Washington May 3-4, 1939.

Hospital News.—The Medical Society of St. Elizabeth's Hospital, Washington, held its first annual dinner at the Kennedy-Warren Hotel, April 14. Dr. Winfred Overholser, recently appointed superintendent of the hospital, and Mrs. Overholser were guests of honor. Cloyd Heck Marvin, LL.D., president, George Washington University, was the speaker. It was announced that a portrait of the late Dr. William A. White, formerly superintendent of the hospital, would probably soon be presented to the hospital.

FLORIDA

Annual Short Course for Physicians.—The sixth annual graduate short course for physicians will be held at the Osceola Hotel, Daytona Beach, June 27-July 2, under the auspices of the Florida Medical Association and the state board of health. The instructors will be:

Dr. Maurice C. Pincoffs, professor of medicine, University of Maryland School of Medicine, Baltimore.

Dr. Wilbur Emory Burnett, associate professor of surgery, Temple University Medical School, Philadelphia.

Dr. Jesse O. Arnold, professor of obstetrics at Temple.

Dr. Alexander J. Schaffer, associate in pediatrics, Johns Hopkins University School of Medicine, Baltimore.

Dr. Robert J. Crossen, assistant professor of clinical obstetrics and gynecology, Washington University School of Medicine, St. Louis.

Dr. Beverley R. Tucker, professor of neuropsychiatry, Medical College of Virginia, Richmond.

Registration will begin promptly Monday morning June 27, although any one wishing to register in advance may do so through Dr. George C. Tillman, Gainesville. A registration fee of $5 will be charged.

IDAHO

Society News.— At a meeting of the Pocatello Medical Society in Blackfoot, April 7, Dr. James O. Cromwell, medical superintendent of the state hospital at Blackfoot, discussed "Schizophrenia and Modern Treatment with Insulin Shock Therapy." V. R. Fisher, Ph.D., also on the staff of the hospital, spoke on negativism and suggestibility in schizophrenia.

Annual Registration Due July 1.— All practitioners of medicine and surgery holding licenses to practice in Idaho are required by law to register annually on July 1 with the department of law enforcement and at that time to pay a fee of $2. If a licentiate has not paid the annual registration fee by October 1, his license can be canceled but will be restored within five years thereafter on payment of the delinquent fees and a $10 penalty. If a license has been canceled for more than five years, it can be reinstated only on the payment of $25 and on the licentiate's passing an examination, the nature of which shall be determined by the department of law enforcement.

ILLINOIS

Society News.—Dr. Morton Hamburger Jr., Chicago, discussed "Serum Therapy of Lobar Pneumonia" before the Kane County Medical Society April 13.——At a meeting of the Champaign County Medical Society in Urbana April 14 Dr. French K. Hansel, St. Louis, spoke on "Various Manifestations of Allergy."——Dr. James Paul Bennett, Chicago, addressed the Bureau County Medical Society April 12 in Princeton on "X-Ray of the Chest and Mediastinum."——Dr. Paul H. Harmon, Chicago, discussed "Poliomyelitis: the Treatment of Acute Poliomyelitis" before the Morgan County Medical Society at Jacksonville April 14.——Dr. Leon Unger, Chicago, addressed the Winnebago County Medical Society at Rockford, April 12, on "Differential Diagnosis and Treatment of Asthmatic Conditions."

Chicago

Courses on Cancer.—James W. Cook, professor of chemistry, University of London, will present two courses on cancer at the University of Chicago this summer, June 15-July 21. One will be on "Cancer-Producing Chemical Agents and Their Biological Effects" and one on "Polycyclic Hydrocarbons and Their Relationship to Biological Problems." The latter course is concerned with the relationship of cancer to hormones.

Seek to Lower Maternal Mortality.—New regulations will be enforced in Chicago hospitals in an effort to reduce maternal deaths. In the future maternity divisions of hospitals are required to be separated from other services. There must be isolation quarters for infected mothers and a separate nursery for infectious infants. Delivery rooms must be separated from surgical and medical departments. Visitors in the maternity division must be limited to two a day in addition to the husband and must be excluded during nursing periods. Children may not be admitted. Contact with babies is prohibited and visitors must not be permitted to sit on the beds. Other provisions pertain to the personnel, sanitation and facilities used in the care of maternity patients.

INDIANA

District Meetings.—The Tenth District Medical Society was addressed in Michigan City April 8 by Drs. Percival Bailey, Chicago, on "Technic and Results of Operation for Brain Tumor"; Newell C. Gilbert, Chicago, "Cardiorenal Diseases," and Frederick H. Falls, Chicago, "Management of Eclamptogenic Toxemia" and Reuben L. Kahn, Sc.D., Ann Arbor, Mich., "Interpretation of Some Paradoxical Reactions in Syphilis" and "Role of Skin Immunity and Allergy."—— The Twelfth District Medical Society was addressed at the Potowatomi Inn, Pokagon, May 19, among others, by Dr. David Benjamin Martinez, Pittsburgh, on "Cesarean Section—Indications and Contraindications" and J. H. Muyskens, Ph.D., Institute of Human Adjustment, University of Michigan, on "The Emergent Process of Speech"; other speakers included some officers of the state medical association.——At a meeting of the Ninth District Medical Society in Noblesville May 17 the speakers included Dr. Norman R. Kretzschmar, Ann Arbor, on "Toxemias of Pregnancy"; in the evening, Jepson Cadou, Washington, D. C., and Indianapolis, addressed the banquet.

IOWA

State Medical Election.—Dr. Felix A. Hennessy, Calmar, was named president-elect of the Iowa State Medical Society at its annual meeting May 13 and Dr. Arthur W. Erskine, Cedar Rapids, was installed as president. Dr. Robert L. Parker, Des Moines, was reelected secretary. Des Moines was selected for the next annual meeting May 10-12, 1939.

Outbreak of Trichinosis.—Eight persons were reported ill with trichinosis in O'Brien County, according to the state medical journal. Four hogs had been butchered on a farm March 1. The woman developed diarrhea and abdominal discomfort March 7, after having eaten some of the raw pork. March 11 the mother, father and five children began eating smoked sausage; and they became ill, March 21. The symptoms were diarrhea, muscular pains, puffiness of the eyelids, swelling of the legs and body, urticarial lesions and itching. Some of the ground pork had been given to relatives in town; a girl became ill after eating uncooked meat but the mother and father, who ate only cooked meat, escaped infection. Examination of the sausage in the state hygienic laboratory showed it to be heavily infested with larvae of Trichinella spiralis. It was estimated that 27,000 larvae were present in five ounces of sausage, about 180 larvae per gram.

KANSAS

State Medical Election.— Dr. Clifford C. Nesselrode, Kansas City, was chosen president-elect of the Kansas Medical Society at its annual session May 12, and Dr. Noble E. Melencamp, Dodge City, was inducted into the presidency. Dr. Harry L. Chambers, Lawrence, is the secretary. The next annual meeting will be in Topeka May 1-4, 1939.

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MAINE

State Medical Meeting.—The Maine Medical Association will hold its eighty-sixth annual meeting at Bar Harbor June 26-28 under the presidency of Dr. Ralph W. Wakefield, Bar Harbor. The program includes conferences on miscellaneous subjects and papers by the following, among others:

Dr. Adam P. Leighton, Portland, The Low Transverse Cervical Cesarean Section.
Dr. John R. Fraser, Montreal, Control and Management of Puerperal Infection.
Dr. Fuller Albright, Boston, Endocrinology in Relation to Obstetrics and Gynecology.
Dr. Frank H. Jackson, Houlton, Medical Publicity.

A symposium on acute respiratory infections will be presented by Drs. Frederick T. Hill, Waterville; Donald S. King, Boston; James L. Wilson, Detroit, and Edward D. Churchill, Boston. One on cancer will be conducted by Clarence C. Little, Sc.D., Bar Harbor, Maine; Miss Elizabeth Fekete, Bar Harbor; Arthur M. Cloudman, Ph.D., and John J. Bittner, Ph.D., all of the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. Reunions of the alumni of Boston University, Johns Hopkins, Bowdoin, McGill and Harvard medical schools will be held and special luncheons for past presidents and county secretaries. The speakers at the annual banquet, at which "fifty year" medals will be presented, will include Gov. Lewis O. Barrows, Dr. Delmer Allan Craig, Bangor, on "The Doctor, Family Friend or Public Servant," and Dr. Frank H. Lahey, Boston, "The Medical and Surgical Management of Peptic Ulcer."

MARYLAND

New Officers of Medical Faculty.—Dr. Dean D. Lewis, Baltimore, was elected president of the Medical and Chirurgical Faculty of Maryland at its annual meeting April 27. Other officers include Drs. Victor F. Cullen, State Sanatorium; Frederic V. Beitler, Baltimore, and William D. Noble, Easton, vice presidents, and Dr. Walter D. Wise, Baltimore, who was reelected secretary. The next annual session will be held at Baltimore April 25-26.

Hospital News.—Construction will soon begin on additions at the Hospital for Women, Baltimore, to include a new four story wing, which will increase the capacity from ninety-five to 120 beds for adults; the improvements under consideration will cost about $330,000. —— Work has begun on the new $320,000 addition to the Negro branch of the Maryland Tuberculosis Sanatorium, Henryton; the unit is expected to be available for occupancy in November, with facilities for from 450 to 475 patients, an increase of 250 beds.

MICHIGAN

Appointments to Basic Science Board.—According to the state medical journal, the following have been appointed members of the recently created basic science board: Warren O. Nelson, Ph.D., Detroit; John P. Van Haitsma, Ph.D., Grand Rapids; Rev. Father George Shiple, Detroit, and Ralph C. Huston, Ph.D., Michigan State College, East Lansing. The appointees are all teachers who are not engaged in the actual practice of any of the healing arts. Another member will be selected from nominations among chiropractors, it was reported.

Graduate Course in Pediatrics.—The Michigan State Medical Society, the state department of health and the department of graduate medicine, University of Michigan, and the Michigan Chapter of the American Academy of Pediatrics sponsored a graduate course in pediatrics at Grayling, Traverse City, Petoskey and Alpena during May. Four lectures at weekly intervals made up the course and the instructors included:

Dr. John L. Law, Ann Arbor, Management of Meningitis, Erysipelas, Scarlet Fever and Streptococcus Infections in General with Particular Reference to the Use and Abuse of Sulfanilamide.
Dr. Wyman C. C. Cole, Detroit, Nontuberculous Infections in the Respiratory Tract as They Occur in Infancy and Childhood.
Dr. James L. Wilson, Detroit, The Newborn Period: Asphyxia (role of analgesic in production of), Resuscitation, Hemorrhage, Atelectasis and Other Conditions of the Newborn.
Dr. Joseph A. Johnston, Detroit, Nutritional Studies in Infant Feeding: Comparative Study of Various Types of Infant Feeding; Diet Requirement in the Older Child and the Adolescent; Relation Between Infection and Nutrition.

Society News.—Dr. Joseph Brennemann, Chicago, discussed "Bronchiectasis, Atelectasis, Emphysema and Allied Conditions in Children" before the Washtenaw County Medical Society in Ann Arbor April 12. —— The Oakland County Medical Society was addressed in Ann Arbor May 11; the speakers were, among others, Drs. Frederick A. Coller on "Surgical Aspects of Gastrointestinal Disease" and Raphael Isaacs, "Some Diagnostic Points in Diseases of the Lymph Nodes." Carl E. Guthe, Ph.D., director of the museum of anthropology, University of Michigan, lectured in the evening.——The Bay County Medical Society and the Saginaw Valley Academy of Ophthalmology and Otolaryngology were addressed April 6 by Dr. William Mithoefer, Cincinnati, on "Nasal Sinus Problems of Interest to the General Practitioner."

MISSOURI

Endowment Fund for Medical Library.—The nucleus of an endowment fund for the library of the Jackson County Medical Society was derived from the proceeds of a tea May 6 given by the woman's auxiliary. The tea was designed as an antique exhibit and hobby show.

State Medical Election.—Dr. James R. McVay, Kansas City, was chosen president-elect of the Missouri State Medical Association at its annual meeting May 4, and Dr. Bernard W. Hays, Jackson, was inducted into the presidency. The next annual session will be held at Excelsior Springs.

District Meeting.—The Second Councilor District Medical Society was addressed in Hannibal April 7. The following, among others, spoke: Dr. Augustin P. Munsch, "Chronic Rheumatoid Arthritis"; Dr. Ralph A. Kinsella, "Streptococcus Infections and Sulfanilamide," and Dr. Cyrus E. Burford, "Urology in Children"; all are members of the staff of the St. Louis University School of Medicine, St. Louis.

Society News.—A symposium on undulant fever was presented before the St. Louis Medical Society April 6; the speakers were Drs. Omer E. Hagebusch, Harry G. Bristow, Roland S. Kieffer, Arthur H. Deppe, John Grey Jones and T. Wistar White. A symposium on office procedures in minor surgery was conducted before the society March 22; the speakers were Drs. Theodore H. Hanser on "Superficial Infections"; Edward L. Keyes, "Subcutaneous Tumors"; Robert W. Bartlett, "Ingrown Toenail"; Clinton W. Lane, "Warts, Moles and Keratoses," and Ralph M. S. Barrett, "Anesthesia in Office Practice."

NEW HAMPSHIRE

State Medical Election.—Dr. Clarence O. Coburn, Manchester, was elected president of the New Hampshire Medical Society at its recent annual session and Dr. James B. Woodman, Franklin, vice president. Dr. Carleton R. Metcalf, Concord, is the secretary.

NEW JERSEY

Dr. Stanley Awarded Rosenberger Medal.—Wendell Meredith Stanley, Ph.D., of the Rockefeller Institute, Princeton, will receive the Rosenberger Medal of the University of Chicago in recognition of his achievement in isolating crystalline forms of the filtrable viruses, it was announced May 25. The medal, founded by Mr. and Mrs. Jesse L. Rosenberger for distinguished achievement in the advancement of learning or for notably great service in the promotion of human welfare, has been awarded five times previously. Dr. Stanley received his degree of doctor of philosophy from the University of Illinois in 1929; he has been a member of the staff of the Rockefeller Institute since 1931.

Society News.—At a meeting of the Bergen County Medical Society in Bergen Pines May 10 Drs. Chevalier Jackson and Chevalier L. Jackson discussed bronchoscopy.——A symposium on comprehensive planning of medical care was presented before the Passaic County Medical Society in Paterson recently by Mr. Sherrard Ewing, executive director of the Paterson Community Chest and Social Planning Council; Emil Frankel, Ph.D., director, division of statistics and research, New Jersey Department of Institutions and Agencies, and Dr. Thomas K. Lewis, Camden, chairman, board of trustees and medical practice committee, state medical society.——Miss Margaret Ritchie, Newark City Hospital, Newark, was reelected president of the Association of Medical Record Librarians of New Jersey for her third successive term at its annual meeting May 4.——Dr. Ralph Colp, New York, discussed "Gallbladder Disease as a Surgical Problem" before the Academy of Medicine of Northern New Jersey May 26.

NEW YORK

Alumni Reunion.—The Association of the Alumni of Albany Medical College will hold its annual meeting and banquet at the Colonie Country Club, Albany-Schenectady Road, June 13.

State Medical Election.—Dr. Terry M. Townsend, New York, was chosen president-elect of the Medical Society of the State of New York at its annual meeting in New York City May 10. Dr. William A. Groat, Syracuse, was inducted

into the presidency. Dr. Walter W. Mott, White Plains, was elected a vice president and Dr. Peter Irving, New York, was reelected secretary.

New State Hospital Building Program. — About $40,000,000 will be spent by the state in constructing public buildings, hospitals, schools and prisons through the use of funds authorized under the bond issue voted by the people at the last election, according to the New York *Times*. In the first year, beginning July 1, about $26,000,000 will be spent. Most of this has been allotted to the department of mental hygiene. The plans include a state school for mental defectives with a capacity of 3,000 patients at a cost estimated at $12,000,000. The site probably will be on Staten Island or elsewhere in the vicinity of New York City. The school is intended for male and female patients. An addition is now being erected to the building for infirm patients of the Brooklyn State Hospital which will increase the capacity for these patients by about 400 and will cost about $437,000. Ten one story buildings for tuberculous patients will be added to the two existing buildings at the Central Islip State Hospital. This group of buildings will increase the patient capacity by about 1,000 and will house all the tuberculous patients for the hospitals under the department of mental hygiene in the metropolitan district. The cost of this project will be $1,115,000. About 1,100 infirm patients at the Kings Park Hospital will be housed in a new building to be built at a cost of around $1,940,000. At the Pilgrim State Hospital it is proposed to construct a group of interconnected buildings to care for about 1,500 patients, the cost to be about $589,000. An addition is being constructed to the reception building at Creedmoor State Hospital which will increase its capacity by 100 patients and cost about $1,940,000. Clinton prison at Dannemora is to have a new hospital for eighty-two general and 116 tuberculous inmates. It is intended to make this hospital the center for all tuberculous inmates in state prisons and the cost will be about $630,000. A ward building is also to be erected at Dannemora State Hospital for Mental Cases with a capacity of 100 inmates, costing about $122,000.

New York City

Plan for Free Maternity Care.—Every expectant mother in Brooklyn will receive full medical attention whether she can pay for it or not in accordance with a plan announced in the New York *Times* May 4. The plan is under the auspices of the Kings County Medical Society and provides that members of obstetric staffs in Brooklyn's forty-nine public and private hospitals will grant consultation when called on. Compensation will not be required except when the attending physician provides evidence that the patient can afford to pay for all or part of his services. Physicians attending maternity cases will be required to call consultants from the obstetric staffs in all instances in which complications develop, while interns will perform obstetric operations only if a member of the hospital staff is present. The new program was adopted following a survey by the committee on maternal welfare of the Kings County Medical Society.

Society News.—Dr. Kingsley Roberts addressed the Society of Medical Jurisprudence May 9 on "Relation of Voluntary Health Associations to a National Health Program."——Among others, Dr. William F. MacFee addressed the New York Surgical Society May 11, on "Malignant Tumors of the Salivary Glands."——The sixth clinical meeting of the Brooklyn Thoracic Society and the bureau of tuberculosis of the New York City Department of Health was addressed May 20 by Drs. Nagla M. Laf Loofy on "Case Finding Through Periodic Contact Examinations"; Mary R. Eleston, "Supervision of Primary Lesion in Children," and Herbert R. Edwards, "The Department of Health Program for the Control of Tuberculosis."——The section on laryngology, rhinology and otology of the Medical Society of the County of Kings gave a testimonial dinner to Dr. Wells P. Eagleton, Newark, N. J., May 11. Dr. Eagleton addressed the section meeting on "Toxic and Allergic Meningitis with an Overflow of Bacteria from the Ear, Nose and Throat."

New Cancer Hospital Nearly Finished.—The cornerstone of the new Memorial Hospital for the Treatment of Cancer and Allied Diseases was placed May 20. The speakers included Dr. James Ewing, director of the hospital, and the ceremonies were held on the anniversary of the laying of the cornerstone of the original Memorial Hospital fifty-four years ago. The structure when completed will cost about $4,000,000, of which $3,000,000 was originally granted by the General Education Board of the Rockefeller Foundation. The site, opposite the Rockefeller Institute for Medical Research, the Cornell University Medical College and the New York Hospital, was given by John D. Rockefeller Jr. The twelve story penthouse building, which is nearly completed, will provide accommodations for 168 beds with provision for expansion. It will contain extensive facilities for diagnostic and treatment clinics, surgery, research laboratories and special provision for irradiation with x-rays and radium. According to the New York *Times*, the box placed in the cornerstone contained publications of the hospital; data on the present five year cure rates at the institution in the different types of cancer, external and internal; gold seeds filled with radon, and other radium applicators developed at the hospital; photographs of the nursing, laboratory, clinical, fellowship and resident staffs, and other articles and documents.

NORTH CAROLINA

Personal. — Dr. James Street Brewer, Roseboro, was appointed a member of the state board of medical examiners at its annual meeting in Pinehurst recently. —— Dr. George Boyce Lynch, Brevard, has been appointed health officer of Transylvania County.

Society News.—The Buncombe County Medical Society was addressed in Asheville May 30 by Dr. Norris W. Vaux, Philadelphia, on "Breech Deliveries"; Dr. Walter R. Johnson addressed the society May 16 on "Value of the Galactose Tolerance Test in Differentiating Medical from Surgical Jaundice." —— At a meeting of the Catawba Valley Medical Society in Morganton, May 10, the speakers were Drs. William L. Kirby, Winston-Salem, on "Newer Conceptions About Eczema" and John S. Gaul, Charlotte, "Fractures of the Extremities."——A symposium on pneumonia was presented at a meeting of the Iredell-Alexander County Medical Society, Statesville, March 8, by Drs. James P. Rousseau, Winston-Salem, Charles B. Herman, Charles L. Bittinger, Statesville, John Y. Templeton, Mooresville, and Joseph S. Holbrook. —— Dr. Harry L. Johnson, Hickory, was elected president of the North Carolina Hospital Association at its annual meeting in Pinehurst April 13.——At a meeting of the Mecklenburg County Medical Society, Charlotte, April 5 the speakers were Drs. John Donnelly, Jasper S. Hunt and Andrew D. Taylor in a symposium on meningitis.

OHIO

Industrial Commission Names Silicosis Referees.—The Ohio State Industrial Commission has appointed three physicians as referees for claims to compensation for silicosis under the workmen's compensation law. Provision for the referees was made in a law recently enacted by the legislature adding silicosis to the list of compensable diseases. The appointees are Drs. Raymond C. McKay, assistant clinical professor of medicine, Western Reserve University School of Medicine, Cleveland; Joseph A. Muenzer, Toledo, formerly associated with the bureau of tuberculosis in the state department of health, and William M. Doughty, director of radiology at Christ Hospital and Children's Hospital, Cincinnati. All claims for disability or death due to silicosis will be referred to these physicians for examination and recommendation for all medical questions.

OREGON

Medical Coordinator Appointed. — Dr. Neil F. Black, Klamath Falls, health officer of Klamath County, has been appointed state medical relief coordinator. He will have charge of developing methods of handling medical aid to those receiving old age assistance, to the blind, and dependent children; he will also work with the profession and civil authorities in furnishing medical aid. Dr. Black graduated at the University of Oregon Medical School, Portland, in 1935.

PENNSYLVANIA

Society News.—Clinics were conducted at a meeting of the Cambria County Medical Society in Johnstown May 12 by Drs. Raymond W. McNealy and Chauncey C. Maher, both of Chicago; in the evening Dr. McNealy discussed "Some Phases of Gallbladder Surgery" and Dr. Maher, "The Problem of Hypertension."——Dr. Albert F. Doyle, Johnstown, addressed the Lebanon County Medical Society, Lebanon, April 12 on "Public Health Aspects of Syphilis." Dr. Hans May, Philadelphia, addressed a meeting of the society May 10 on plastic surgery.——The McKeesport Academy of Medicine was addressed May 23 by Dr. Frank A. Evans, Pittsburgh, on obesity.——Drs. Robert L. Gilman, Philadelphia, and William

W. Bolton, Upper Darby, discussed syphilis before a meeting of the Northampton County Medical Society, Bethlehem, May 20.——Dr. Carl E. Irvin, Harrisburg, addressed the Dauphin County Medical Society May 3 on "Diagnosis and Treatment of Undulant Fever."——Dr. George E. Bennett, Baltimore, addressed the Harrisburg Academy of Medicine recently on "Low Back Pain."——Dr. Wendell J. Stainsby, Danville, addressed the Shenandoah County Medical Society at its May meeting on chronic arthritis.

Philadelphia

Patterson Fellowship and Teaching Fund.—The Patterson Fellowship and Teaching Fund is to be established at Jefferson Medical College, in accordance with the will of the late dean of the college, Dr. Ross V. Patterson. Two trust funds for $60,000 each and one for $30,000 were set up in the will but on the deaths of the beneficiaries the money will be used for the fellowship and teaching fund. It will go to graduates "whose records indicate ability beyond the average, to make possible to them further medical study, investigation and training, the better to fit them for careers in the practice of medicine, in medical teaching, in public health service, or in research." During such training the recipients are to be known as "Patterson Fellows." The will also stipulates that the fund be used to pay salaries of full time teachers in the Training School for Nurses of the Jefferson Hospital. Newspapers report that, if for any reason the college cannot accept the benefaction, it is offered in the order named to the University of Pennsylvania, Temple University and University of Pittsburgh.

TENNESSEE

Dr. Mullowney Retires as President of Meharry.—Dr. John J. Mullowney, since 1921 professor of public health and president of Meharry Medical College, Nashville, has announced his retirement, effective July 1. He will be succeeded by Dr. Edward L. Turner, professor of medicine. Dr. Mullowney was born in Seacombe, England, July 20, 1878, coming to the United States in 1887. He received his degree in medicine at the University of Pennsylvania School of Medicine, Philadelphia, in 1908. He served as professor of nervous and mental diseases, North China Union Medical College, Peking, 1908-1911; inspector of tenement and lodging houses, Philadelphia, 1912-1913; assistant chief of the Pennsylvania State Department of Health, 1913-1917, and head of the department of science and professor of chemistry and hygiene, Girard College, Philadelphia, 1917 to 1921 when he went to Meharry. Dr. Turner graduated at the University of Pennsylvania School of Medicine in 1928.

TEXAS

Surgical Meeting.—The Texas Surgical Society met in Houston April 4. Dr. Elbert Dunlap, Dallas, gave the president's address on "Surgical Diagnosis." The other speakers were:

Dr. Nathan A. Womack, St. Louis, The Diagnosis of Cancer of the Bronchus.
Dr. Edward White, Dallas, Perinephric Abscess.
Dr. Eutus P. Bunkley, Stamford, The Perforated Peptic Ulcer.
Dr. Charles C. Cade, San Antonio, The Conservative Treatment of Carbuncles.
Dr. Walter G. Stuck, San Antonio, Peripheral Nerve Injuries Complicating Fractures.
Dr. Gomer F. Goff, Dallas, Sulfanilamide in Pelvic Infections.
Dr. George W. N. Eggers, Galveston, Elbow Fractures.
Dr. George R. Enloe, Fort Worth, Obstructive Lesions of the Colon.
Dr. Herbert T. Hayes, Houston, Electrocoagulation of Tumors of the Rectum.
Dr. Albert O. Singleton, Galveston, The Anatomy of the Sympathetic Nervous System.
Dr. John T. Moore, Houston, The Physiology of the Sympathetic Nervous System.

The next meeting will be held in Galveston in October.

WISCONSIN

Personal.—Harry Steenbock, Ph.D., professor of agricultural chemistry, University of Wisconsin, known for his work on vitamins, will receive an honorary degree at the university commencement June 20.——Dr. William D. Stovall, professor of hygiene, University of Wisconsin Medical School, Madison, has been appointed acting superintendent of the State of Wisconsin General Hospital, Madison, during the leave of absence of Dr. Robin C. Buerki to become director of study of the commission on graduate medical education.——The Medical Society of Milwaukee County gave a dinner in honor of Mr. Theodore Wiprud recently, following his resignation as executive secretary to accept a similar position with the Medical Society of the District of Columbia. Dr. Eben J. Carey, dean and professor of anatomy, Marquette University School of Medicine, was toastmaster and the speakers included Drs. Raymond G. Arveson, Frederic; Stanley J. Seeger, Milwaukee; Rock Sleyster, Wauwatosa; Ralph P. Sproule, Edward L. Tharinger and John S. Gordan, Milwaukee. Mr. Wiprud was presented with a set of golf clubs by the society.

GENERAL

Alumni Smoker.—Alumni of Jefferson Medical College, Philadelphia, will hold a smoker at the Union League Club, 555 Post Street, San Francisco, June 15.

Medical Women's Association.—The twenty-third annual convention of the American Medical Women's Association will be held in San Francisco June 12-14, with headquarters at the Fairmont Hotel. The program includes the following speakers:

Dr. Anita M. Muhl, San Diego, The Doctor's Mental Attitude.
Dr. Ann P. Purdy, San Francisco, Nutrition.
Dr. Kathleen M. Murphy, San Francisco, Relationship of the Estrogenic and Gonadotropic Hormones to Climacteric Symptoms.
Dr. Olga L. Bridgman, San Francisco, The Psychiatric Aspect of the Juvenile Court.
Dr. Evelyn M. Anderson, San Francisco, Clinical Conditions Related to the Adrenal Cortex.
Dr. Amy N. Stannard, Berkeley, Calif., Family Relationship Affecting Delinquency.

Meeting of Medical Librarians.—The fortieth annual meeting of the Medical Library Association will be held at Boston June 28-30 at the Hotel Somerset. Sessions will be held at the Boston Medical Library and Harvard Medical School with open house in the libraries of the city. The speakers will include Drs. Henry R. Viets, Boston, Sanford V. Larkey, Baltimore, John F. Fulton, New Haven, Conn., and Mrs. Eileen R. Cunningham, Miss Isabelle T. Anderson, Mr. James F. Ballard and Mr. Herman H. Henkle, director, school of Library Science, Simmons College, who will conduct an institute for medical librarians. Other features will include symposiums on a "Guide to Medical Literature" and "Medical Literature of the Past."

Meeting of Urologists.—The American Urological Association will hold its annual meeting in Quebec June 27-30 under the presidency of Dr. David W. MacKenzie, Montreal. The program includes a symposium on sulfanilamide with the following speakers: Drs. Eli K. Marshall Jr., Baltimore; Edwin P. Alyea, Durham, N. C.; John A. C. Colston, Baltimore; James I. Farrell, Evanston, Ill.; Clarence R. O'Crowley, William L. James and Harold Lawrence Sutton, Newark, N. J.; Pearl F. Summerfeldt and David R. Mitchell, Toronto, and John L. Crenshaw and Edward N. Cook, Rochester. The following, among others, will speak:

Drs. Charles J. E. Kickham and Norman H. Bruce, Boston, Urologic Complications in Malignant Disease of the Rectum.
Drs. Dorrin F. Rudnick and Edward L. Cornell, Chicago, Strictures of the Ureter in the Female.
Dr. Arthur Elmer Belt, Los Angeles, A New Anatomic Approach to the Prostatic Capsule in Perineal Prostatectomy.
Drs. Ernest Rupel and Richard C. Travis, Indianapolis, Mandelic Acid Therapy: Action of Enteric Coated Tablets of Mandelic Acid (as Monoethanolamine Mandelate) and Ammonium Chloride.

David L. Thomson, Ph.D., Montreal, will deliver the Ramon Guiteras Lecture on "Endocrinology in Its Relations to Urology."

Special Society Elections.—Dr. Walter R. Steiner, Hartford, Conn., was elected president of the American Association of the History of Medicine at its annual meeting May 2 and Dr. Henry E. Sigerist, Baltimore, was elected secretary. The next annual meeting will be in Atlantic City in May.——At the annual meeting of the American Association of Pathologists and Bacteriologists May 4 the following officers were elected: Drs. Earl B. McKinley, Washington, D. C., president; Carl V. Weller, Ann Arbor, vice president, and Howard T. Karsner, Cleveland, secretary. The next annual session will be held at Richmond, Va., April 6-7.——Dr. Oscar B. Hunter, Washington, D. C., was elected president of the American Therapeutic Society at its annual meeting April 2, and Dr. Joseph F. Elward, Washington, D. C., secretary.——Dr. Stephen W. Ranson, Chicago, was chosen president of the American Association of Anatomists at its meeting April 14 and Dr. Eliot R. Clark, Philadelphia, was named secretary. The next annual session will be held at Boston April 6-8.——Dr. Frank D. Dickson, Kansas City, Mo., was chosen president-elect of the American Orthopedic Association at its annual meeting May 5; Dr. William W. Plummer, Buffalo, N. Y., is president, Dr. Ralph K. Ghormley, Rochester, Minn., was reelected secretary. The next annual session will be held at Buffalo.——Dr. Tinsley R. Harrison, Nashville, Tenn., was elected president of the American Society for Clinical Investigation at its annual meeting May 2 and Dr. Isaac Starr Jr., Philadelphia, was chosen secretary.

CANADA

Balfour Lecture.—Dr. Gordon Gordon-Taylor of the staff of Middlesex Hospital, London, England, delivered the Donald C. Balfour Lecture in Surgery at the University of Toronto April 5. His subject was "Gastric Hemorrhage."

Society News.—Dr. Henricus J. Stander, New York, addressed the Academy of Medicine of Toronto, March 1, on "Cardiac Disease in Pregnancy."——Dr. Lyon H. Appleby, Vancouver, delivered the Osler Lecture of the Vancouver Medical Association March 1; his subject was "Quo Vadis, Medicina?"

Anniversary of Medical Library.—The *Bulletin* of the Academy of Medicine of Toronto dedicated its April issue in honor of the fiftieth anniversary of the Ontario Medical Library Association. The first annual meeting of the association, formed by the Toronto Medical Society, the Ontario Medical Association and the College of Physicians and Surgeons of Ontario, was held July 13, 1888. At the annual meeting of 1889 it was reported that the association had ninety-one members, 1,300 bound and 250 unbound volumes in the library and fifty-nine journals on file. In 1907, when the academy of medicine was organized with the library as its nucleus, it had 4,602 volumes and now has 27,065. The first book presented to the library was a copy of Oliver Wendell Holmes's "Medical Essays" with an inscription by the author. The special issue of the bulletin describing the collections in the library, especially mentions the influence of Sir William Osler, who throughout his life made many gifts to the library. One of the prized possessions is a collection of medical portraits made by Sir William and presented by his brother, Sir Edmund Osler, in 1909. A recent addition is a collection of about 200 volumes on pathology assembled by the late Prof. Oskar Klotz.

Government Services

Dr. Treadway Placed in Charge of Narcotic Farm

Dr. Walter L. Treadway, assistant surgeon general, U. S. Public Health Service, Washington, D. C., has been appointed medical officer in charge of the federal narcotic farm at Lexington, Ky., succeeding Dr. Lawrence Kolb, who is transferred to Washington to become assistant surgeon general. Dr. Treadway was assistant physician of the Jacksonville (Ill.) State Hospital from 1908 to 1912. He was commissioned as assistant surgeon general in the public health service in 1913 and was made chief of the division of mental hygiene of the service in 1930. Dr. Kolb has been medical director of the narcotic farm, the first of its kind, since its opening in 1935. He graduated at the University of Maryland School of Medicine in 1908.

Warning on Filled Milk Act

The Food and Drug Administration of the U. S. Department of Agriculture warns that it will institute legal action against all interstate shipments of any product falling within the statutory definition of filled milk. The warning follows the recent decision of the U. S. Supreme Court in the case of *United States* v. *Carolene Products Company*, which upheld the Federal Filled Milk Act of 1923 as constitutional. By its terms the act prohibits the interstate distribution of any combination of milk, cream or skimmed milk with any fat or oil other than the milk fat so as to resemble or imitate milk or skimmed milk in any form. The legislation was enacted after a congressional hearing. Congress determined and declared "That filled milk, as herein defined, is an adulterated article of food injurious to public health and its sale constitutes a fraud upon the public." The indictment in the Carolene case alleged the unlawful interstate shipment of "Milnut" and "Carolene" manufactured by Carolene Products Company of Litchfield, Ill. Analyses by the Food and Drug Administration showed the products to be composed essentially of evaporated skim milk and coconut oil in semblance of evaporated whole milk. After prosecution was started, the manufacturer filed a demurrer to the indictment on the ground that the act was unconstitutional. The demurrer was sustained by the federal court for the Southern District of Illinois. The United States appealed to the supreme court of the United States, which upheld the filled milk act as constitutional, according to a release from the U. S. Department of Agriculture.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 14, 1938.

Advance in the Treatment of Cancer

At the annual meeting of the Royal Cancer Hospital, Mr. Cecil Rowntree, senior surgeon, said that the hospital was now supplied with the latest and most efficient apparatus that it was possible to wish for and that they had consolidated the somewhat tentative conclusions toward which they had gradually been feeling their way. "We have now learnt," he continued, "the best ways of dealing with the widely different types of malignant disease. We now know which are the types of cancer best treated by purely surgical operation. We know that in other forms, such as cancer of the tongue, mouth and throat, we can confidently expect such results from radium bomb treatment as have never been equaled or even approached by any other form of therapy and with the Schaoul type of x-ray machine we are constantly and consistently curing such diseases as cancer of the lip and face and cancer of the skin with such certainty, simplicity and safety as has never been experienced before. In fact, give us a case of cancer in any of these situations in a reasonably early stage, and we will now guarantee its complete and speedy disappearance."

Rapid Decline of London's Child Population

The London County Council has just published a new edition of the Statistical Abstract for London, which shows a rapid fall of the child population. In 1937 only 417,028 children were attending public elementary schools, as compared with 560,527 ten years previously. Thus the child population declined by more than a fourth in this short period, and if this rate of decline should continue for fifty years the total at the end of that period would become less than a fourth of the present number. This decline of child population shows what is not generally understood—why a fall in our general population is inevitable under the present birth rate although our population still shows an annual increase. The reason is that children are not being produced in sufficient number to replace their predecessors, while the level of population is being maintained by the number of adults and their greater longevity. But this effect can be only temporary, as the level of population must ultimately depend on the number of children born and reared. Indeed, the fall of the general population is not far off. It is calculated that in 1940 or thereabouts our population will reach its maximum and then begin to decline, at first slowly and later more rapidly.

Vulvovaginitis in Children

The London County Council has now the largest hospital system in the world, containing 36,000 beds in which all kinds of specialization are carried out. It has had a wide opportunity for observing vulvovaginitis in children and has for more than two years maintained a careful watch for this disease among the many thousands of children under its care. It has just published a report in which medical superintendents of its hospitals, veneorologists, pediatricians and pathologists have cooperated. In the period mentioned, 627 cases of vulvovaginitis were discovered in the council's general and special hospitals, residential schools and homes and nurseries for infants, of which only thirty-two were found to be gonococcic, and in the great majority of the latter were nonsexual in origin.

GONOCOCCIC VULVOVAGINITIS

Infection is usually accidental, the result of contamination of the vulva with infected fomites, such as towels, sponges, bed linen or lavatory seats. The manner in which material for bacteriologic diagnosis is collected is of great importance. Swabs

should be taken only by a clinician expert at the task. A probe mounted with absorbent cotton must be passed well into the vagina and withdrawn with some discharge on it. In the treatment no packing of the vagina should be carried out and only nonirritating lotions should be used, such as 0.5 per cent strong protein silver. Estrogen in daily doses of from 3,000 to 6,000 units by mouth has proved useful. Sulfanilamide has given encouraging results, but it is too soon to assess its value. The vulva should be swabbed with a lotion and dusted with a drying powder as often as is necessary to keep it free from pus and as dry as possible. There is a tendency to relapse. Criteria of cure are negative tests (films, cultures and gonococcus complement fixation) for a minimum of four months.

NONGONOCOCCIC VULVOVAGINITIS

Nongonococcic vulvovaginitis is not uncommon between the ages of 2 and 7 years. It may be due to acute specific infections (chickenpox, measles and scarlet fever), acute throat infections or foreign bodies. Differentiation between the various types can be made only by bacteriologic tests, though clinical signs are highly suggestive. Thus, in diphtheroid infections, redness of the vulva with scanty discharge is present. Foreign bodies produce a blood-stained offensive discharge; staphylococci, a thick creamy discharge; streptococci, a thinner colorless discharge; Bacillus coli, an offensive discharge with characteristic odor. The treatment calls for considerable judgment. Many cases are mild and require little except baths and local cleanliness. Severe cases should be treated on the same lines as gonococcic cases. The great majority of cases clear up in two or three weeks.

ADMINISTRATIVE ASPECTS

Administrative aspects are of great importance, as an organization undertaking the care of children, sick or healthy, has two obligations: (1) to protect noninfected children from infection; (2) to detect, isolate and treat any case. In the council's schools and receiving homes the children's underclothing and bed linen are watched for evidence of discharge. For obvious reasons the examination of any little girl is not a light matter but must be undertaken if necessary. If there is definite evidence of vulvovaginitis, she must be transferred to a hospital. It is the practice of the council to concentrate at a special hospital all cases in which a report is made of the presence of "organisms morphologically resembling the gonococcus."

PARIS

(From Our Regular Correspondent)

May 14, 1938.

Decline in Birth Rate Alarms France

The drop in birth rate as compared to the increase in the number of deaths is causing much anxiety here. The present and future defense of the country calls for a birth rate which is at least equal to that of Germany and Italy. In these two countries there has been a constantly increasing excess of births over deaths during the past five years. A committee was appointed several months ago by the Académie de médecine of Paris to study methods of checking the drop in birth rate. At the April 26 meeting Professor Lereboullet submitted the report of the committee. The chief causes of the decline in the birth rate were found to be contraceptive methods and the widespread use of abortifacients or induced abortion. There were only 630,000 births in 1937 as compared to a little over a million in 1876. From 1935 to 1937 inclusive there were 57,117 more deaths than births in France, as compared to an excess of 950,000 births over deaths in Germany and of 775,000 in Italy during 1936 and 1937. The committee believed that the causes of the denatality in France were chiefly moral and economic. The following were the recommendations of the committee:

1. That the gravity of the denatality question be made known to the public by every possible method.

2. That an appeal be made to the moral and spiritual forces of the country to encourage the raising of large families by granting large subsidies which increase proportionately to the number of children.

3. That the danger of induced abortions be impressed on the women of the country and that the laws already in existence which entail imprisonment and heavy fines for abortionists be rigorously applied.

Polycystic Disease of the Pancreas

Only ten reported cases of polycystic disease of the pancreas could be found by Loeper, Lemaire and Lesobre, who have published a personal observation in the May 7 issue of *Progrès médical*. Polycystic disease of the pancreas, although related to unilocular or multilocular cyst formation, so far as its pathogenesis is concerned, differs from these more common conditions in its gross and microscopic appearance as well as in its clinical manifestations. Polycystic disease of the pancreas is characterized by the formation of multiple minute cysts similar to those found at times in the parotid, breast, liver, kidney and ovary. The patient in question was a woman aged 77 who was admitted to the service of Professor Loeper Sept. 13, 1937, complaining of a severe diarrhea of a month's duration. Examination revealed an intense icterus, the urine containing both bile salts and pigments and stools, which although clay colored often showed the presence of blood. The clinical picture was that of an obstructive jaundice. The lower margin of a firm liver was felt three fingerbreadths below the costal arch, and the distended gallbladder could be plainly outlined on palpation. There was a marked loss of weight and a severe pruritus. The patient died five weeks after admission. At the necropsy a greatly enlarged liver and distended gallbladder and common duct were first noted. The head of the pancreas was hard and, on section, the pancreas presented innumerable cysts varying in size from that of a lentil to that of a pea. On microscopic study these cysts were seen, for the most part, to be empty, a few showing several layers of cylindric epithelium. But little pancreatic tissue was to be found anywhere, but there was a hyperplasia of the few persisting islands of Langerhans. The latter finding could explain the absence of a glycosuria which had been noted clinically. Sections of the liver, on microscopic examination, showed all the typical changes of an obstructive jaundice.

Of ten reported cases, in three the polycystic disease of the pancreas had not given rise to symptoms and was found at necropsy; in two cases there was an accompanying severe diabetes, one of the patients dying in coma; two showed clinical evidences of obstructive jaundice, one with glycosuria; only one presented symptoms of indigestion and the tenth patient had a progressive cachexia with anemia and steatorrhea.

It is impossible at present to explain the origin of this polycystic condition of the pancreas, except on a congenital basis.

Program of 1938 French Pediatric Congress

The tenth annual meeting of the French Pediatric Congress will take place October 6-8. The meeting place is the medical amphitheater of the Paris Children's Hospital. The following will form the subjects of special reports and general discussion:

1. Severe anemias in infancy, by Dr. Louise Weill of Lyons.
2. Toxi-infections in infancy, by Dr. R. A. Marquezy and Miss Ladet.
3. Megalocolon and dolichocolon, by Drs. Rohmer and Boppe.

American pediatricians who wish to take part in the discussions are asked to write to Dr. Maurice Lamy, 94 rue de Varenne, Paris (7).

Program of Seventeenth Annual Neurologic Reunion

This year's neurologic reunion will be held May 31 and June 1 at the Hôpital Salpétrière, where the late Professor Charcot held his clinics. The chief subject for discussion will

be the role of the pupil in neurology. Papers will be read by Drs. Bollock, Edouard Hartmann, Monbrun, Velter and Tournay. Particular attention will be paid first to objective study (pupillometry) of the pupil while at rest and the pupillary reactions; second, to changes in the pupils in disease and, third, to search for physiopathologic explanations of the preceding. Other papers include as subjects cerebral blood supply, experimental polyneuritis, toxic epilepsy, nervous complications of leukemia and diagnosis and indications for operative intervention in craniocerebral injuries.

Program of 1938 Meeting of French Medical Congress

The twenty-fifth annual French Medical Congress will be held September 26-28 inclusive at Marseilles under the presidency of Professor Olmer. The subject chosen for reports and discussion are (1) spirochetosis of infectious jaundice, (2) hypochloremia and (3) present day treatment of avitaminoses in adults. American physicians who wish to attend the congress can receive information by writing to Prof. Henri Roger, 66 Boulevard Notre-Dame, Marseilles.

Proposed Statue to Honor the Memory of Laënnec

At a meeting of the Assemblée française de médecine held in May 1936 at the birthplace of the internationally known clinician Laënnec it was decided to ask for subscriptions to erect a monument near the site of the former Charity Hospital in Paris, where Laënnec taught for many years.

BERLIN

(From Our Regular Correspondent)

April 19, 1938.

News of the Universities

One of the important functions of a university is to maintain an adequate supply of prospective professors. Many qualified young scholars, however, find it impossible to remain at the universities as docents without financial assistance, and this economic consideration threatens a real shortage of younger teachers. Regulations relative to the compensation of docents have recently been planned to provide an official subsidy for every graduate who receives a teaching certificate. The young scholar would thus be guaranteed a steady means of livelihood. It seems that a critical situation has been developing in which promising young docents were forced to quit the universities for economic reasons and to seek a livelihood in other fields. The new plan was scheduled to go into effect April 1 but its inauguration has as yet not been possible. Temporary reforms to aid needy docents have, however, been introduced. Special subsidies are available to a docent who has a scholastic record and a personality which augur well for a successful academic career, good moral character, a disposition to act at all times "unreservedly in harmony with the national socialist state and to be an active exponent of the national socialist weltanschauung," and, further, eligibility under the German statute governing the racial extraction of public employees, an earnest desire to be of service to the university, and, finally, economic circumstances that justify the granting of a subsidy. A whole series of further conditions, based on the merits of the individual case, is imposed at the time the assistance is granted. A subsidy is extended for a period of two years but may be stopped sooner if reasonable grounds for dissatisfaction with the docent's academic activities develop or in the event of other disqualifying circumstances. Rectors of the universities and deans of the faculties are required to report any circumstance that might be a basis for disqualification. Other officials, the local fuehrers of docents, for example, may of their own initiative propose the revocation of a grant.

The statute to regulate dueling among students has lately undergone revision. There is a tendency to enlarge the jurisdiction of the student courts of honor. This trend has a justifiable basis in the formerly too great powers of the courts of honor; these tribunals often undertook to decide cases that related to "honor" in only the most superficial sense and which really had to do with gross breaches of discipline. Under the last named classification fall all instances of public insults, malicious slander and unprovoked jostling which are perpetrated by a student while in an intoxicated or semi-intoxicated state. The new law places a more limited construction on the term "case of honor"; a valid case must now be based only on genuine, serious, deliberate affronts to a student's honor. Weapons must no longer be taken up for every trifling provocation.

The rules of the duel have been altered. Pistol duels among students are prohibited. In place of the stationary fencing bout, the "starke mensur" fought with heavy sabers, the law prescribes the mobile mensur with the light Hungarian saber. Moreover, the national fuehrer of students has until further notice reserved to himself the right of passing on the legality of all saber duels approved by the courts of honor. (The foregoing regulations do not apply to the military duel; the army has a code of its own which is much more stern than that of the students. It sanctions, for example, a pistol duel that must be carried on until one party is hors de combat.)

Officialdom has recently become particularly interested in improved dental services for students. Special dental services are to be made available to all university students. The fees asked for filling teeth will be fixed by law. Students unable to pay for such service will be treated free of charge; 220,000 marks has been allocated for this purpose by the government.

Finally, the anschluss with Austria has made necessary a vast number of changes within the universities of the annexed territory. The data available with regard to these changes are herewith summarized: The Austrian minister of education, Dr. Menghin, has issued decrees designed to place the universities in line with the new régime. Orders have been given for the dismissal of certain faculty members and the installation of new academic functionaries. Regulations governing examinations which derived from the political complexion of the late Austrian republic were immediately set aside when the nazis came to power. To keep the Austro-German universities from becoming overalienized by Jewish matriculants, the minister has imposed restrictions on the enrolment of Jewish students. No further registrations of Austro-German Jews will be accepted for the summer semester of 1938; already accepted registrations of Jews will be allowed to stand for the time being subject to cancellation. In future a numerus clausus of Jewish students will be established. Special rules apply to the matriculation of foreign Jews.

It has been decreed that all members of academic faculties who on racial or political grounds were unable to take the oath of allegiance to Adolf Hitler, and all those who were arrested or dismissed from their posts at the time the nazis took over, are until further notice ineligible for academic service. The former statute of higher education has been nullified. The government expects that former students who were expelled from the universities under the last mentioned law as adherents of the nazi movement will now resume their interrupted studies.

Vienna University has already lost a number of professors through dismissal. Professor Arzt, ordinarius in dermatology there, appears to be among those removed. Arzt is not a Jew. For many years he has been editor-in-chief of the *Wiener klinische Wochenschrift* but on the cover of the April 1 issue (No. 13) his name is absent from the accustomed place and in its stead appear the words "acting editorial staff." Whether this means that Arzt's connection with the journal is definitely severed cannot be stated at the present writing.

Dr. Kronfeld has for several decades edited the *Wiener medizinische Wochenschrift* and has also been especially active in the organization of international graduate study at Vienna. The April 2 (No. 14) issue of this journal carried the name

of a new editor. Moreover, page 1 of this issue was given over to an appeal for support of the new régime and an announcement that the publication had been transferred to "Aryan ownership, Aryan management and Aryan editorship."

The Acceleration of Development in Childhood

It is common knowledge that an acceleration in the rate of growth among children has been reported from various countries. Dr. Bennholdt-Thomsen, senior physician at the children's hospital of the university of Frankfort on the Main, has recently attempted to establish the scientific basis of this remarkable change by means of a questionnaire survey of girls in Hesse-Nassau province. On the basis of this study he formulates the following conclusions: (1) The growth of the present generation of children is more rapid as against that of earlier generations, (2) city children are taller than country children, (3) within the cities children whose parents are in good economic circumstances are taller than children of the poorer classes, (4) more premature appearance of the centers of ossification (evaluated as another sign of development) also takes place earlier among the city children with good economic backgrounds than among the poorer children, (5) menstruation unquestionably begins earlier among the present generation as against earlier generations, (6) city girls begin to menstruate at an earlier age than country girls, (7) among the urban population, daughters of well-to-do parents located in the largest cities menstruate earlier, whereas girls of the slum areas menstruate latest, (8) in a majority of families the daughters menstruate at an earlier age than did their mothers, (9) both primary and secondary dentitions, the former in particular, occur earlier among the daughters as contrasted with the mothers and (10) even with respect to the earlier eruption of primary dentition the geographic sequence remains: city, small town, country; this phenomenon too is manifested earlier among city children.

The author advances the following explanation of this earlier development: Emigration of the restless, more lively elements from the rural community has led to a great accumulation of nervous, sensitive, impressionable types of people in the urban areas. These elements have further multiplied within the city. Meanwhile the many sided phases of urban life have come to exert a cumulative effect on this more intelligent group of the population. The result has been an earlier beginning of growth and an accelerated rate of development among the youth of today. As a possible means of combating this phenomenon the author suggests planned decentralization to curb the further growth of the mammoth metropolis of today and an attempt to induce the struggling urban masses to return to the land.

Eightieth Birthday of Professor Pfeiffer

Prof. Richard Pfeiffer of Breslau, bacteriologist, celebrated his eightieth birthday March 27. Pfeiffer began his professional career as a military surgeon. From 1887 to 1891 he served as assistant to Robert Koch and in the latter year was appointed director of the Scientific Section of the Prussian Institute of Infectious Diseases, Berlin. In 1897 he served on the German Commission for Investigation of Plague in India and in the following year, with Robert Koch, he studied malaria in Italy. Pfeiffer became ordinarius in hygiene at Koenigsberg in 1899 and assumed in 1909 a similar post at Breslau, where he served until his retirement in 1925. He was the first to describe the development of the Coccidia. Best known and most associated with his name was the discovery and isolation of the influenza bacillus in 1892. Pfeiffer's phenomenon is of great value in the diagnosis of cholera. With Wilhelm Kolle he developed methods of immunization against typhoid, cholera and plague. His studies of the delimitation of resistance by genuine active immunity have become fundamental principles of immunology. His textbook of microbiology is perhaps the best known of his publications.

BUCHAREST

(From Our Regular Correspondent)

May 9, 1938.

The Antianaphylactic Action of Vitamin C

Dr. Nitulescu made experiments by regularly giving from 100 to 200 mg. of vitamin C daily to children who were inoculated with antidiphtheritic serum, with a view of preventing anaphylaxis. His experience in these experiments was that vitamin C is actually capable of preventing anaphylaxis, though not in every case. Among forty-one children who received vitamin C, only six had anaphylactic symptoms, while among forty-five children not receiving vitamin C twenty-one had serum disease. Nitulescu states that continental experimenters are administering vitamin C also to overcome intolerance to arsphenamine. They state that by adding from 0.05 to 0.1 Gm. of ascorbic acid to the arsphenamine solution one can administer it to persons who otherwise could not bear it at all. They applied vitamin C orally too but the result was not satisfactory.

Hastening Healing After Operations

Dr. Campeanu, lecturer at the University of Bucharest, who is well known beyond the boundaries of Rumania, has methodically diminished the time spent in bed by surgical patients and at present he puts his patients on their feet directly from the operating table. During the period 1934-1938 3,150 laparotomized patients left their beds on the day following the operation. They did not experience any disadvantage that might have been caused by the early rising. Occasionally a patient observed some vertigo, but this may be observed also in patients kept in bed for the usual longer period. Encouraged by the experiences gained with the 3,150 patients, Campeanu went further and since Jan. 11, 1937, patients operated on under local anesthesia have been put on their feet directly from the operating table, whatever the operation may have been. Every patient was instructed to behave just like any other convalescent patient. They dressed themselves or with the help of a nurse. They went alone to the ward or to the hospital grounds and walked up or downstairs. Some of them walk in the park after the operation; others read books or listen to the radio. There are patients who take gymnastics, but there are also some who on reaching the ward take a rest in bed.

On the second day after operation patients who have been operated on under general or spinal anesthesia are similarly dealt with. Patients operated on for appendicitis or hernia, if living in Brasov, where Dr. Campeanu operates, are dismissed from the hospital on the third or fourth day, those from the country on the fourth or fifth day. They return on the seventh or eighth day for the removal of the sutures. In none of the 1,300 patients were there any complications which could have been the result of early rising. On the contrary, the patients remained free from such complications as pulmonary congestion or thrombophlebitis. All authors who have experimented with getting their patients out of bed early have found that motion is the means which prevents stasis. Campeanu says that motion promotes leukocytosis and that getting up immediately is a psychic as well as a physical stimulant, which curtails the duration of the disability. An assistant of Campeanu whose appendix had been removed, after having stepped down from the operating table, forthwith acted as assistant at the next operation and afterward walked about. His recovery was prompt. By shortening the stay of patients in the hospital, the surgical section of Campeanu's clinic in Brasov were able with the same number of beds to accommodate 500 more patients than in the previous year. This new method is of inestimable advantage in time of war. The evacuation of war

hospitals thus becomes simplified. Contraindications for such early rising are general debility of a major degree, high fever, serious complications on the part of other organs, and abdominal drainage. Of the 1,300 patients, three died: one of a perforated duodenal ulcer on the thirty-fifth day after operation caused by general peritonitis; one of pulmonary cancer well after the operation, as a result of hemoptysis from a mediastinal blood vessel; the third on the fourth day after unsuccessful decapsulation of the kidney from anuria due to mercury poisoning.

In Memory of the Late Professor Babes

On May 6, 1888, in Rumania the first antirabic injection was given to a patient bitten by a dog suspected of being infected with rabies. The physicians of the country celebrated, amid great solemnities, the memory of the founder of the Bucharest antirabic institute, Dr. Victor Babes, whose name is internationally known. The arranging committee gave a scientific character to the festivities by having lectures relating to the present status of the problem of rabies. The festivities were held in the Bucharest Babes institute. The committee on arrangements was headed by Professors Marinescu and Balacescu. Professor Babes, who was born in 1854, studied medicine in Vienna and worked in the clinics of Langer and Rokitanski, on whose recommendation he was appointed assistant at the Budapest anatomicopathologic institute from 1872 to 1888. In 1881 he was appointed lecturer on pathologic histology. Then he went abroad and worked with Professor Ziemssen of Munich, Arnold of Heidelberg, Recklinghausen and Waldeyer of Strasbourg, Koch and Virchow of Berlin and Pasteur and Cornil of Paris. In the latter's clinic in Paris, in conjunction with Professor Cornil, Babes edited the first textbook of bacteriology under the title The Bacteria. Professor Cornil recommended Babes to a professorship at Bucharest university, to which he was invited in 1888. In that year the legislative corporation voted a special law which accorded the necessary sum for the foundation and erection of a pathologic and bacteriologic institute, which was opened under the direction of Babes in 1889. This institute also served for teaching experimental pathology, bacteriology and pathologic anatomy. He wrote about 700 treatises. His greatest works are Atlas der pathologischen Histologie des Nervensystems (Berlin, 1892), Traité de la rage (1912) and Original Researches on Pellagra in Rumania (1915).

Marriages

LEE EDWARD PARMLEY, Big Spring, Texas, to Miss Thelma Lowery of Winter Haven, Fla., in Fort Worth, February 24.

FRANK ALBERTUS MOORE BRYANT, Bronxville, N. Y., to Miss Janice James of Beverly Hills, Calif., April 22.

EDMUND S. LOCKHART, Nokomis, Ill., to Miss Wilma V. Showers Reiser of East St. Louis, March 1.

JOSEPH HALFORD PATTERSON, Broadway, N. C., to Miss Gaynelle Seawell of Greensboro, March 5.

THOMAS MORTON RAINES, Wakefield, Va., to Miss Alice Virginia Hill of Dendron, February 24.

HOWARD C. RUFUS, Ann Arbor, Mich., to Miss Hilda Myers of Lancaster, Pa., February 28.

HOMER DAVID HICKEY to Miss Marguerite Eilene Bacon, both of Chattanooga, Tenn., recently.

MORRIS B. PAYNTER, Southport, Ind., to Miss Mabel Kearns of Plainfield, February 2.

EARL WILLIAM ROLES to Miss Nannie Evans, both of East Orange, N. J., April 14.

WILBUR E. BURNETT to Miss Peyton Bolling Jones, both of Philadelphia, May 24.

CLAIR G. SPANGLER to Miss Lillian Slater, both of Reading, Pa., April 19.

Deaths

Ellis Fischel ✠ St. Louis; Washington University School of Medicine, St. Louis, 1908; associate professor of clinical surgery at his alma mater and formerly associate professor of surgery at the St. Louis University School of Medicine; chairman of the state cancer commission; member of the Southern Surgical Association and the American Radium Society; fellow of the American College of Surgeons; at various times on the staffs of St. Mary's, DePaul, Barnard Free Skin and Cancer, Jewish and St. Luke's hospitals; aged 54; was killed, May 14, in an automobile accident.

Edward Frost Parker ✠ Charleston, S. C.; Medical College of the State of South Carolina, Charleston, 1889; an Affiliate Fellow of the American Medical Association; past president of the South Carolina Medical Association; professor emeritus of ophthalmology and otolaryngology and formerly dean at his alma mater; served on the medical advisory board during the World War; fellow of the American College of Surgeons; aged 70; died, March 28, of cerebral arteriosclerosis and chronic myocarditis.

Edward Josiah Brown ✠ Minneapolis; Dartmouth Medical School, Hanover, N. H., 1879; an Affiliate Fellow of the American Medical Association; member of the American Academy of Ophthalmology and Oto-Laryngology; past president of the Hennepin County Medical Society; formerly member of the city and state boards of health; aged 87; died, March 15, of cardiac decompensation and arteriosclerosis.

Joseph Walter Mills, Owensville, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1913; member of the Missouri State Medical Association; county health officer; member of the city board of health; aged 56; died, March 1, in the Missouri Baptist Hospital, St. Louis, of edema of the lungs and postoperative hernia.

Charles Henry Leonard, Providence, R. I.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1868; member of the Rhode Island Medical Society; Civil War veteran; for many years in charge of vaccination of the city health department; aged 95; died, March 19, of arteriosclerotic heart disease.

John Ross Mitchell ✠ Joliet, Ill.; Northwestern University Medical School, Chicago, 1916; member of the Clinical Orthopedic Society, American Academy of Orthopedic Surgeons and the Radiological Society of North America; aged 50; died, March 17, in St. Joseph's Hospital, of diabetes mellitus and bronchopneumonia.

Frederick Herrick Aldrich, Belview, Minn.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; formerly member of the state legislature, mayor and postmaster; served during the World War; aged 66; died in March of myocarditis, diabetes mellitus and streptococcic infection.

Stanley Edward Stroube, Livermore, Calif.; University of Tennessee College of Medicine, Memphis, 1914; fellow of the American College of Surgeons; served during the World War; on the staff of the Veterans Administration Facility; aged 46; was found dead, March 21, of carbon monoxide poisoning, self administered.

Duncan MacCalman, Baltimore; Baltimore Medical College, 1895; served during the World War; formerly connected with the U. S. Veterans Bureau; aged 73; associated from 1895 to 1901, and superintendent from 1898 to 1900 of the Maryland General Hospital, where he died, March 14, of carcinoma of the colon.

John Alexander Robinson ✠ New York; University and Bellevue Hospital Medical College, New York, 1899; member of the American Laryngological, Rhinological and Otological Society and the American Otological Society; on the staff of the New York Eye and Ear Infirmary; aged 61; died, March 24.

Wallace Nelson Brown, Watertown, N. Y.; University of Vermont College of Medicine, Burlington, 1890; Bellevue Hospital Medical College, New York, 1892; aged 72; died, March 17, in the St. Lawrence State Hospital, Ogdensburg, following a prostatectomy, of chronic myocarditis and arteriosclerosis.

Willoughby Carr Pendill, Huntington, N. Y.; Syracuse University College of Medicine, 1913; member of the Medical Society of the State of New York; served during the World War; formerly on the staff of the Huntington Hospital; aged 49; died, March 13, in Yuma, Ariz., of angina pectoris.

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Charles Samuel McIntyre, Hastings, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1896; member of the Michigan State Medical Society; on the staff of the Pennock Hospital; aged 68; died, March 2, in West Palm Beach, Fla., of coronary thrombosis.

Ira Mesick Garrison, East Greenbush, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1876; for many years health officer of East Greenbush and Schodack; aged 82; died, March 29, in St. Peter's Hospital, Albany, of pernicious anemia and uremia.

Le Verne Holmes ✠ Manchester, Conn.; Boston University School of Medicine, 1904; veteran of the Spanish-American and World wars; served on the staff of the Manchester Memorial Hospital in various capacities; aged 58; died, March 26, in Scarsdale, N. Y., of coronary occlusion.

Benjamin Arnauld Smillie, Gilmore City, Iowa; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; member of the Iowa State Medical Society; secretary of the Pocahontas County Medical Society; aged 68; died, March 7, of coronary embolism.

Wayne McKnight Shirley ✠ Carroll, Iowa; Rush Medical College, Chicago, 1905; served during the World War; past president and secretary of the Carroll County Medical Society; health officer; on the staff of St. Anthony Hospital; aged 57; was found dead, March 20.

John Winford Stevens ✠ Nashville, Tenn.; University of Nashville Medical Department, 1900; member of the American Psychiatric Association; owner of the City View Sanitarium; aged 58; died, March 18, in St. Thomas Hospital of carcinoma of the colon.

William Whitfield White, Houlton, Maine; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1874; Jefferson Medical College of Philadelphia, 1878; member of the Maine Medical Association; aged 87; died, March 6, of pneumonia.

Carl Lorraine McCallum, Sapulpa, Okla.; University of Nashville (Tenn.) Medical Department, 1895; member of the Oklahoma State Medical Association; past president of the Creek County Medical Society; aged 59; died in March of septicemia.

Charles Joseph McGurren ✠ Devils Lake, N. D.; Minneapolis College of Physicians and Surgeons, 1904; formerly secretary of the state board of health; on the staff of the Mercy Hospital; aged 64; died, March 11, of carcinoma of the sigmoid and liver.

Anthony Joseph Thomas, Easton, Pa.; Georgetown University School of Medicine, Washington, D. C., 1935; aged 30; died, March 12, in the Newark (N. J.) Eye, Ear and Nose Hospital of streptococcic meningitis, chronic mastoiditis and otitis media.

Peter Albert Sundbury ✠ Holdrege, Neb.; Keokuk (Iowa) Medical College, 1894; past president and secretary of the Phelps County Medical Society; on the staff of the Holdrege Hospital; aged 71; died, March 17, of chronic nephritis and arteriosclerosis.

Homer Francis Peirson, Austin, Minn.; Rush Medical College, Chicago, 1895; past president of the Mower County Medical Society; for many years county coroner; aged 71; died, March 24, in St. Olaf Lutheran Hospital of cerebral hemorrhage.

Clarence S. Beals, Wyoming, N. Y.; University of Buffalo School of Medicine, 1903; health officer of the town of Middlebury and the village of Wyoming; aged 59; died, March 20, of chronic myocarditis, arteriosclerosis and chronic nephritis.

Charles Ignatius Proben, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1890; Bellevue Hospital Medical College, New York, 1890; aged 74; died, March 21, of heart disease.

Garfield Ray Salsberry, Lyons, Ohio; Detroit College of Medicine, 1903; member of the Ohio State Medical Association; member and past president of the county board of education; aged 58; died, March 23, in an automobile accident.

John Nelson Teeter ✠ Englewood, N. J.; Bellevue Hospital Medical College, New York, 1892; served during the World War; formerly on the staff of the Englewood Hospital; aged 67; died, March 5, of coronary occlusion.

Emory James Rhoades ✠ Walla Walla, Wash.; University of Colorado School of Medicine, Denver, 1911; served during the World War; aged 54; died in March at a local hospital following an operation for gallstones.

George Corlett Radcliffe ✠ Peninsula, Ohio; Cleveland Homeopathic Medical College, 1898; Medical Department of Ohio Wesleyan University, Cleveland, 1901; aged 63; died, March 22, of cerebral thrombosis.

Charles Kirtland Stillman ✠ Mystic, Conn.; Columbia University College of Physicians and Surgeons, New York, 1904; served during the World War; aged 58; died, March 22, of pulmonary tuberculosis.

William V. Russell, Dalton, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1909; also justice of the peace; aged 68; died in March in the Hamilton Memorial Hospital of pneumonia.

S. I. Sturges, Azle, Texas; University of Tennessee Medical Department, Nashville, 1893; aged 69; died, March 21, in a hospital at Fort Worth of cerebral thrombosis, hemiplegia and bronchopneumonia.

Lillis Adora Wood Starr, Los Angeles; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1891; aged 72; died, March 4, of injuries received in an automobile accident.

Ralston William Sleeter, Medford, Ore.; State University of Iowa College of Medicine, Iowa City, 1909; member of the Oregon State Medical Society; aged 55; died, March 9, of coronary disease.

Charles Basil Murray, New York; Bellevue Hospital Medical College, New York, 1887; member of the Medical Society of the State of New York; aged 74; died, March 30, of myocarditis.

William Wesley Earles, Seattle; Milwaukee Medical College, 1910; member of the Washington State Medical Association; aged 54; died, March 5, at Rochester, Minn., of hypertension.

Clarence Rupert Morss ✠ Zumbrota, Minn.; University of Pennsylvania Department of Medicine, Philadelphia, 1908; aged 57; died, March 23, in Rochester, Minn., of carcinoma of the lung.

James B. Smith, Dunlap, Tenn.; University of Nashville Medical Department, 1896; aged 65; died, March 28, in the Pine Breeze Sanatorium, Chattanooga, of tuberculosis of the kidneys.

Charles Roscoe Smith, Livermore Falls, Maine; Medical School of Maine, Portland, 1897; member of the school board; aged 72; died, March 21, of carcinoma of the brain and left lung.

Nathan Ryno Smith, Baltimore; University of Maryland School of Medicine, Baltimore, 1886; member of the Society of American Bacteriologists; aged 74; died, March 30, of erysipelas.

M. H. Proudfoot, Rowlesburg, W. Va.; Starling Medical College, Columbus, 1884; formerly member of the state board of health; aged 77; died, March 21, of cerebral embolism.

Anna M. Jack, New Castle, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1897; aged 67; died, March 15, at Greenville, Tenn., of sclerotic cardiovascular disease.

Peyton Stark Lewis, Richmond, Va.; Medical College of Virginia, Richmond, 1919; member of the Medical Society of Virginia; aged 48; died, March 9, of myocarditis.

Philip Henry Berlenbach ✠ Richmond Hill, N. Y.; Long Island College Hospital, Brooklyn, 1891; aged 75; died, March 23, in the Mary Immaculate Hospital, Jamaica.

Nicholson Few Curtis, Dobbs Ferry, N. Y.; Western Reserve University Medical Department, Cleveland, 1912; aged 53; died, March 20, of cerebral hemorrhage.

Iver Stoland ✠ Eau Claire, Wis.; Rush Medical College, Chicago, 1911; served during the World War; aged 53; died, March 8, of a self-inflicted bullet wound.

Joseph Amedee Girouard, Lewiston, Maine; School of Medicine and Surgery of Montreal, Canada, 1889; aged 74; died, March 1, of carcinoma of the stomach.

J. Webb McGehee, Baton Rouge, La.; Tulane University of Louisiana Medical Department, New Orleans, 1900; aged 62; died, March 8, of angina pectoris.

James H. Hylton, Table Rock, Neb.; Lincoln Medical College of Cotner University, 1903; aged 66; died, March 2, at Elmwood of obstructive biliary cirrhosis.

William F. Ashley, Shaw, Miss.; Tulane University of Louisiana Medical Department, New Orleans, 1901; aged 72; died, March 22, of cardiorenal disease.

Emerson Sumers Porter, Columbus, Ohio; University Medical College of Kansas City, Mo., 1895; aged 67; died, March 8, of coronary occlusion.

William Lovett, Detroit; McGill University Faculty of Medicine, Montreal, Que., Canada, 1870; aged 85; died, March 19, of arteriosclerosis.

Sollis Runnels, Indianapolis; Chicago Homeopathic Medical College, 1887; aged 83; died, March 13, of angina pectoris.

Paul E. Redd, Richmond, Va.; Medical College of Virginia, Richmond, 1895; aged 65; died, March 27, of myocarditis.

Correspondence

THE USE OF ZINC SULFATE SOLUTION FOR THE PREVENTION OF POLIOMYELITIS IN MAN

To the Editor:—In THE JOURNAL a year ago (June 26, 1937, p. 2182) we reported that 1 per cent zinc sulfate solution thoroughly applied to the olfactory mucosa in monkeys affords a high degree of protection against poliomyelitis virus instilled intranasally a month later. Because susceptibility returned in most of the monkeys when they were retested some months later, and the anosmia following the application of zinc sulfate solution in man seemed to be only of temporary duration (Peet, M. M.; Echols, D. H., and Richter, H. J.: The Chemical Prophylaxis for Poliomyelitis, THE JOURNAL, June 26, 1937, p. 2184), we suggested a field test to determine the value of this solution in preventing the disease in man. Opportunities to carry out such tests appeared a few months later in several eastern cities. The results of one of these has been recently reported (Tisdall and others: *Canad. Pub. Health J.* **28**:523 [Nov.] 1937). It is not our purpose to comment on the results of this test except to say that we believe the authors do not in any way answer the important practical question whether zinc sulfate solution properly applied is of value in preventing the disease in man. Our chief reason for regarding this test as uninformative on this point is the fact that the figures given indicate that probably not more than 14 per cent of those sprayed were actually treated thoroughly enough to cover all of the olfactory area. From the observations of Peet, Echols and Richter, of Pentecost (*Canad. Pub. Health J.* **28**:493 [Oct.] 1937) and of Hayden (*M. Clin. North America,* January 1938), which show that anosmia almost always follows a thorough application of zinc sulfate, it would appear that about 85 per cent of those sprayed in the Toronto test were not treated thoroughly enough to cover all of the olfactory area. We believe that this failure can be laid largely to the difficulties which attend the effective use of the special atomizer suggested by Peet, Echols and Richter. A simpler and probably more efficient method of covering the olfactory area has since been suggested by Shahinian, Bacher, McNaught and Newell (THE JOURNAL, April 16, p. 1254). Our purpose in this communication, however, is not so much to deal with the technic of applying the solution as to point out an important risk attending the application of zinc sulfate solution to the olfactory area.

To obtain protection the solution should probably be applied thoroughly enough to induce a temporary anosmia, and to maintain such resistance as may be afforded the application should probably be repeated as soon as the sense of smell returns. But while anosmia is probably an important index of sufficiently thorough treatment and the persistence of anosmia possibly evidence of continued resistance, no one wants such a functional effect to be lasting. While in children the sense of smell seems always to return within a few weeks, in adults it may be much longer in returning. We know of a few cases in adults in whom this function did not return until after periods of from two to four months. What is especially important is that recently we have learned of several cases in adults in whom the sense of smell has not yet returned after a period of more than six months. We do not know of any cases of lasting anosmia in children.

In adults the pain that immediately follows the application of the solution is apt to be more severe and of longer duration than in children. We believe that both the severity of the immediate reaction and the duration of the anosmia may be based on certain anatomic differences which influence the length of time the chemical may act on the olfactory mucosa. We understand that in adults the superior common nasal meatus tends to be much narrower and deeper than in children. A very narrow cleftlike meatus would tend to hold solutions by capillary attraction. Such retention would naturally result in a more prolonged and uncontrolled drug action, resulting in more intense and prolonged pain and a more profound injury to the olfactory mucosa. These considerations, together with our recent observation that in some monkeys there is a rather severe exudative inflammation of the olfactory mucosa, associated with desquamation of epithelial cells, especially in animals examined from one to two days after treatment with 1.5 per cent zinc sulfate solution, prompts us to sound a word of caution against the further use of zinc sulfate in man until more is known about the mechanism underlying the protection in monkeys; also about the risk of inducing permanent anosmia in man.

The fact that susceptibility in monkeys generally returns after several months and the fact that children generally regain the sense of smell within two weeks seems to show that a 1 per cent solution of zinc sulfate (U. S. P.) can be applied to many persons without much risk of producing permanent anosmia. At the same time it is clear that this risk does exist and that it is greater in adults. It may prove greater in children than experience thus far seems to indicate if the induction of anosmia is made a criterion of successful treatment and theoretically an index of the duration of the protection afforded by zinc sulfate solution.

The risk of inducing a lasting anosmia may possibly be reduced if the zinc sulfate solution is followed within a few minutes by drops of physiologic solution of sodium chloride instilled by the Shahinian method. This would have the effect of reducing the length of time that a full strength solution of zinc sulfate would be permitted to act, should it tend to be held by capillary attraction in the superior common nasal meatus. At any rate the treatments should never be repeated more than necessary to induce and maintain anosmia nor should they be carried out with solutions containing more than 1 per cent zinc sulfate (U. S. P.). The use of local anesthetics should probably be avoided.

We shall appreciate greatly additional information bearing on the duration of the anosmia in man following the application of zinc sulfate solution. Such information will help us in answering the many inquiries that come to us. While we are continuing investigations on the mechanism of chemically induced resistance in monkeys, we appreciate that the full answer as to the practicability of such a measure cannot be obtained from experimental observations in animals. We wish therefore to urge physicians to transmit to us their individual experiences.

E. W. SCHULTZ, M.D.
L. P. GEBHARDT, PH.D.
Stanford University, Calif.
Department of Bacteriology and Experimental Pathology.

THE DOSAGE OF ANTITOXIN IN A CASE OF TETANUS

To the Editor:—In THE JOURNAL April 16, page 1271, appeared a case report by Cables and West entitled "The Amount of Antitoxin Used in a Case of Tetanus." They report that 3,460,000 units of antitoxin was administered over a period of forty-one days. The authors state that "with the modern methods of preparation of tetanus antitoxin it is possible to give large amounts of it without serum sickness," and that it is best to continue serum administration as long as any increased tonus of muscles is present.

Such a course would result in unwarranted deaths in a disease that already has a high fatality rate.

For twelve years I have had supervision and management of all tetanus cases admitted to the Los Angeles County Hospital, which averages about twenty-five cases annually.

In a previous publication (Vener, H. I.; Bower, A. G., and McKillop, J. E.: Clinical Tetanus, a Study of 131 Cases, *California & West. Med.* **39**:6 [Dec.] 1933) it was emphasized that "regardless of the age of the patient, the sex, the average incubation period, the etiological factor or the site of injury, or with the amount of antitoxin given as an initial dose up to 100,000 units, the fatality rate was at least 50 per cent. Furthermore, that the greatest number of deaths occurred within the first three days of hospitalization, and that if a patient could be kept alive for a period of nine days following admission the chances for recovery were 90 per cent in his favor."

The cost of the antitoxin must be given careful consideration. At the market price prevailing last summer, the approximate rate per hundred thousand units was $50. As a result, approximately $1,700 worth of serum was given when $125 worth would have sufficed. At the current market price, the cost of the antitoxin has been reduced, on an average, about one third.

During the past thirty-four months I have instituted at the Los Angeles County Hospital a regimen of management, with certain modifications, for the treatment of clinical cases of tetanus and have published a preliminary report (Treatment of Tetanus, *California & West. Med.* **48**:3 [March] 1938). According to this report, and up to April 1, 1938, I have supervised a consecutive series of seventy-five cases, with twenty deaths, a gross fatality rate of 26.6 per cent. This contrast is rather significant when compared with the death rate prior to the current study of approximately 52 per cent. The lowered fatality rate included some patients who died within a very short period of admission, and in several instances they did not receive any antitoxin. Crediting as hospital deaths the nine cases in which death occurred within the first twenty-four hours of admission, there was a series of sixty-six cases with eleven deaths, a net fatality rate of 16.6 per cent. I advocate that, as soon as a diagnosis of tetanus is made, the case be considered as a surgical emergency and immediate treatment instituted.

Cables and West stress the fact that serum sickness appeared about nineteen days after admission, but still they continued to give antitoxin. This administration of serum as cited, for a period of nearly six weeks, should be condemned. In my experience the average hospital stay of a patient has been about three weeks. The total dosage of antitoxin administered, exclusive of the desensitizing doses, is 200,000 units per case.

In our present series, despite the refinement in preparation of antitoxin, and all precautions as to sensitivity tests, serum sickness has occurred, approximately, in 35 per cent of the cases. Serum sickness frequently accentuates the irritability of the patient and the spasticity of the muscles. Experience has demonstrated that such a condition is not due to a relapse. I feel that it is not necessary to continue serum therapy as long as the patient has spasms. This condition may often continue for two or three weeks and occasionally a little longer, but it is not an indication for continued therapy. Titration studies on the blood (Spooner, E. T. C., and Cole, Leslie: The Treatment of Tetanus, with Observations on the Fate of Injected Antitoxin, *Quart. J. Med.* **4**:295 [July] 1935), following the intravenous administration of 200,000 units as a single dose, revealed that the antitoxin disappeared rather rapidly at first and then more slowly. However, at the end of seven days there still remained about 10 units of antitoxin per cubic centimeter and at the end of fourteen days there was from 3 to 5 units of antitoxin per cubic centimeter of blood.

HYMAN I. VENER, M.D., C.P.H., Los Angeles.
Assistant Epidemiologist, Los Angeles
City Health Department.

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Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

INTRADERMAL TREATMENT IN HAY FEVER

To the Editor:—What evidence is there that the intradermal method of treating hay fever by means of extracts of timothy pollen is as efficacious as the usual subcutaneous route? M.D., New York.

ANSWER.—Injections for hay fever are given either preseasonally, coseasonally or perennially. Preseasonal injections are usually given subcutaneously; in the perennial method, according to which injections are given all the year round, the subcutaneous method is likewise in general use. However, in the coseasonal method, in which injections are given during the hay fever season, the intradermal (intracutaneous) technic is employed by many. Vaughan in 1923 advocated subcutaneous injections during the season; but Phillips in 1926 and again in 1933 advised intradermal pollen therapy during the attack. Phillips reported 91 per cent satisfactory results in 322 patients who were given low dosages of appropriate pollen extracts intracutaneously. The maximum amount injected was 0.17 cc.; if more was injected the dose was divided. Permanent scars were thus avoided. Phillips pointed out that glycerin extracts, especially if concentrated, tend to be painful and to leave scars. Phillips had twelve general reactions in this series. His patients were given extracts of the pollens of Bermuda grass, careless weed, Russian thistle and others.

Thommen is strongly in favor of the intradermal method for coseasonal treatment. He points out, however, that only small amounts can be used with safety. Unger and Moore brought out a new extracting fluid consisting of 5 per cent dextrose with 0.5 per cent phenol; this is not irritating and is especially valuable in intradermal therapy.

Rackemann and others have shown definitely that intradermal injections of pollen extracts give much larger local reactions and are much more likely to cause constitutional symptoms than equal doses given subcutaneously. The epithelial tissues seem to have much more histamine or a histamine-like substance than the mesenchymal subcutaneous tissue; this histamine substance seems to be important in initiating allergic reactions.

It must be added that many other men have not found good results by either subcutaneous or intradermal treatment during the hay fever season. Most still prefer the preseasonal method, and the perennial method is becoming more and more popular.

HUMAN ANTITYPHOID SERUM UNDESIRABLE—PREPARATION OF RABBIT ANTITYPHOID SERUM

To the Editor:—Will serum made in the human body be all right for antityphoid agglutination work? How much vaccine should be given? At what titer must the serum be? What are the chances of getting a typhoid infection with a high titer? What technic should be used for building up a sufficient titer in the rabbit? HUGH EARLE, Fulton, Ky.

ANSWER.—Antityphoid serum from human sources is not desirable for use in identifying unknown organisms. Chief among the objections to its use are the facts that: (*a*) The patient may have had a mild case of paratyphoid fever or may have been inoculated with T. A. B. or T. A. B. C. vaccine in the past and the injection of typhoid vaccine will raise the paratyphoid antibody titer, resulting in a serum containing mixed antibodies. (*b*) Some human beings fail to develop H (flagellar) agglutinins in response to infection or inoculation. The antiserum would therefore contain only O (somatic) agglutinins. H agglutination is commonly used for the differentiation of types of enteric organisms. Bacillus typhi and B. enteritidis, for example, have the same somatic antigen. (*c*) Somatic agglutinins produced in human beings fail to show the specificity that rabbit serums show and that might be expected from the known antigenic structure of the typhoid and paratyphoid bacilli. (*d*) High titers, i. e., 1:1,000 or more, are not commonly found in human serums. For these and other reasons, human antityphoid serums are of doubtful quality.

The agglutinin titer of serums from typhoid patients varies not only with individuals but with the day of the disease on

which the specimen is taken. It is reasonable to conclude from recorded data that the great majority of typhoid infections will, during the third week, show an H titer of 1:200 and an O titer of 1:100 or better. Titers of 1:650 are not uncommon and titers of 1:1,000 may be regarded as exceptionally high.

Antiserums may be prepared in rabbits by the inoculation of twenty-four hour cultures of living motile typhoid bacilli. The suspension is ordinarily prepared by washing up the growth on agar with sterile saline solution and adjusting to a concentration of approximately 500 million per cubic centimeter. The following inoculation procedure has been found satisfactory: 0.5 cc. intraperitoneally, 1 cc. intraperitoneally, 0.5 cc. intravenously, 1 cc. intravenously, 2 cc. intravenously. The injections are made at five day intervals if the animal does not lose weight. If weight is lost, it is best to repeat the immediately preceding injection and then continue as before. Five days after the last injection a small amount of blood is removed from the ear for testing. If the titer is satisfactory the animal is exsanguinated from the heart. Such a serum should have a titer of 1:5,000 or better. It will contain both H and O agglutinins. Monospecific O antiserums may be prepared by growing the typhoid bacilli on phenol (1:1,000) agar. Monospecific H antiserums may be prepared by absorbing the mixed antibody serum with O antigen, i. e., bacilli grown on phenol agar, and leaving only the H agglutinins remaining.

PRECOCIOUS DEVELOPMENT IN CHILD AFTER ESTROGENIC TREATMENT FOR GONORRHEA

To the Editor:—A girl, aged 5, was infected with gonorrhea when she was 3. She was treated by a child specialist for one year with theelin, 1,000 units weekly. The family then moved to another city and, the child being still infected, she was given amniotin and vaginal treatment and has had that for a year now. She was recently brought to me, with the smear still positive and with definite signs of precocious development of the breasts and a slight pubic growth of hair. Could this development be from the long continued use of the endocrine treatment or is it something else? I have changed my method of treating childhood gonorrhea but would appreciate any information you would give me concerning this case.

J. O. HAMPTON, M.D., Blackfoot, Idaho.

ANSWER.—The treatment of gonorrheal vaginitis in the child before puberty has always been recognized as difficult and unsatisfactory. It is known that, in the immature girl, gonorrheal infection is limited to the vaginal mucous membrane and seldom involves the undeveloped accessory glands of the cervix. It is also known that in the adult woman gonorrhea rarely involves the vaginal mucous membrane and, if present, is of short duration.

The reason for these differences in localization is that in children the vaginal mucous membrane is thin and delicate, consisting of from four to eight layers of epithelial cells, with many rugae or folds. Gonococci flourish on this delicate mucous surface and eventually penetrate into the subepithelial spaces, where they become resistant to local treatment.

Edgar Allen (*J. Morphol.* **46**:479 [Dec. 5] 1928) demonstrated that estrogen administered to immature monkeys increased the number of vaginal epithelial layers with cornification of the surface epithelium, a condition characteristic of the adult vaginal mucosa.

R. M. Lewis (*Am. J. Obst. & Gynec.* **26**:593 [Oct.] 1933) reasoned that, if he could change the immature vaginal epithelium of the child to the adult type by the use of estrogen, he could eliminate the gonococcic infection. That this can be done has been proved many times, and it forms the basis for the estrogenic treatment of gonorrheal vaginitis in children.

Lewis and Adler (THE JOURNAL, June 13, 1936, p. 2054) thought originally that the mere histologic change involved in temporarily converting the thin vaginal mucosa of the child to the far thicker and partly cornified structure of the adult adequately explained the destruction of the invading gonococci. Further studies have convinced them that the curative result is in all likelihood due not to the histologic change alone but to a striking change in the reaction of the vaginal secretions. The nearly neutral reaction, normal in childhood, changes to acidity, which always accompanies temporary maturation of the mucosa.

It is the present belief that the treatment of gonorrheal vaginitis in children by the use of estrogenic vaginal suppositories is more effective than is the intramuscular administration of estrogen.

It is stated that "the child was given 1,000 units of theelin weekly for one year." The method of administration is not described. This was later followed by amniotin suppositories for one year. The frequency of treatment and the amount used is again not stated. The vaginal smears are still positive for gonococci and the child has definite signs of precocious development of the breasts and a slight growth of pubic hair.

The child has had more than sufficient theelin to produce development of the adult type of vaginal mucosa with cornification of the epithelial layer, if it has been properly administered with regard to time and concentration. The evidences of precocious development are almost surely due to the prolonged administration of estrogen. With this patient it was correct and justifiable to discontinue the estrogen.

It seems best in this case to use nonestrogenic treatment now. Sulfanilamide might be tried. If other measures fail, perhaps after six months estrogen suppositories (1,000 international units) inserted each night for thirty days might again be tried. Smears should be examined to check success or failure.

FAMILIAL PERIODIC PARALYSIS

To the Editor:—About five years ago a man on lying down in bed, especially if he was to lie on his back, would at times hear a roaring in his ears, which was accompanied by absolute inability to move any muscles with the exception of his eye muscles and the muscles of his tongue. The feeling would wear away in a few seconds and entirely disappear. If during this time while the symptoms were present some one should lift his arm or shift his body in any way the symptoms would immediately cease. Physical examination and all laboratory reports were negative. Within the last three months two additional patients have complained of practically the same syndrome. One patient states that the syndrome is present in whatever position he lies and can be dissipated only if he is able to get his tongue between his teeth so that he can bite it. The other patient states that the syndrome comes on only as he is awakening from sleep. On awaking he finds himself unable to move. I am unable to account for this group of symptoms and any information that you can offer will be appreciated.

M.D., Massachusetts.

ANSWER.—Paralysis of the voluntary muscles coming on suddenly and disappearing with equal rapidity occurs characteristically in familial periodic paralysis, a rare disease, usually hereditary in character. Although most of the attacks begin in childhood, it is not uncommon for the onset to be delayed until the third decade of life. Often attacks occur early in the morning, just as the patient is awakening, although there may be prodromal symptoms the day before. Sweating often accompanies the paralysis, which reaches its maximum within a few minutes. The muscles supplied by the cranial nerves are not ordinarily affected. The tendon reflexes are lost during the attack, together with the electrical excitability of the muscles to both faradic and galvanic stimulation. There is a great variation in the frequency of the attacks, and patients are known to have attacks as often as every four or five days, particularly in winter.

The disease was described by Westphal and Oppenheim in 1885 and its hereditary character by Goldflam in the same year. The best recent account in English is by T. K. Maclachlan (*Brain* **55**:47 [March] 1932). There is no treatment known which is effective either in preventing this disease or in shortening its course. It would be unusual for any physician to have two cases, both without hereditary factors. A further investigation is indicated along this line, as well as a more accurate description, particularly with regard to reflexes and electrical tests during a period of paralysis.

HOME SALTED PORK

To the Editor:—People of Italian extraction here are fond of preserved pork, which they preserve themselves from fresh pork. The meat is first salted for some time and then fresh salt and black pepper are added and the meat is wrapped up in waxed paper and kept in the cellar. While it is in the cellar a greenish mold develops almost invariably on the outside of the meat, which I don't see on the commercial type put out by the large packing concerns. Is there any danger from these molds? Could anything be added to the salt and pepper to prevent their formation, and if so what? Since this meat is eaten raw, how long a time should elapse, to be reasonably safe from trichinosis, before the meat is eaten? The meat is not ground but trimmed from so-called butts and sausage is made from the trimmings. The local name is "longetta," although other classes of Italian people refer to it as "capo-collo."

M.D., Pennsylvania.

ANSWER.—There is no evidence that the molds on this meat are dangerous to health. No safe material can be added to salt and pepper to prevent the formation of molds. The large commercial packing concerns make a product called capicolla. The pork in this product is cured for twenty-five days in 3 per cent salt at from 36 to 38 F. It is then stuffed in casings and smoked for two days at 90 F., after which it is held for twenty-five days in a drying room at 52 F. Trichinella is not reported to survive this process. In answer to the third question, the home prepared meat could not be considered safe, since under the conditions mentioned Trichinella might survive for many weeks.

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NUMOTIZINE AND PLASTERS IN RESPIRATORY DISEASE

To the Editor:—What is the value of medication applied in the form of ointments or plasters to the chest wall in upper respiratory infections, acute bronchitis and pneumonia? The chief constituents of such—judging by the odor—are guaiacol, oil of pine needles and menthol. Some are offered by reputedly ethical pharmaceutical houses; more of them are sold under a patent name (e. g., Numotizine) to the public. Is there sufficient absorption of guaiacol through the skin to make its use in this fashion justifiable? Do any of the other constituents exert a more favorable action when applied this way? Is there any action of medicaments of this description other than counterirritation?

M.D., Illinois.

ANSWER.—Numotizine is the name applied to the preparation known for many years under the name "Pneumo-Phthysine." It is stated to contain guaiacol 2.6 parts, solution of formaldehyde 2.6 parts, quinine 2.6 parts, methyl salicylate 2.6 parts and creosote 13.02 parts in a glycerin and aluminum silicate (kaolin) base, to make 1,000 parts. From this formula it appears that the preparation is a clay poultice (similar to the cataplasm of kaolin of the National Formulary) to which has been added guaiacol, formaldehyde, quinine, methyl salicylate and creosote.

The Council on Pharmacy and Chemistry considered this preparation more than twenty-five years ago and declared it inadmissible to New and Nonofficial Remedies because the therapeutic claims that were made for it were considered unwarranted, exaggerated and absurd, because the label on the trade package constituted an indirect advertisement to the public and because the name "Pneumo-Phthysine" was not descriptive of the composition of the mixture. Although poultices are often employed for maintaining rubefaction of the chest in patients with bronchitis or bronchopneumonia, there appears to be no evidence that Numotizine is an efficient means of producing the systemic effects of the various drugs which it contains. Incidentally, the advertising matter for Numotizine that is in the Council's files contains no recommendation for the use of the product as a treatment for pneumonia.

EXCESSIVE LIBIDO IN MAN

To the Editor:—A man, aged 53, clever and successful in business, has always been so oversexed that he has as many as twelve orgasms during one intercourse. If he misses intercourse for more than three days he cannot do justice to his business, becomes nervous and always feels much better after intercourse. He has been suffering from hyperinsulinism for the past five years. He had a goiter (exophthalmic) removed twelve years ago and has taken thyroid extract ever since. When he takes too much his sex capability increases. He feels that at his age so much libido is dangerous to his health. What can be done for him? Would cauterization of the verumontanum be indicated? Would prostatectomy affect his business ability?

M.D., Michigan.

ANSWER.—This is probably a mild form of satyriasis and in some cases, in which the verumontanum is enlarged and congested so that it continually touches and irritates the urethral mucous membrane, cauterization may effect a cure. Otherwise, no remedy has thus far been found to alleviate the condition, though at times large doses of bromides may help to reduce the sexual passion. Prostatectomy will have no influence on the condition and should be performed only when the usual urologic indications for the operation exist.

CONTROLS IN SCHICK AND DICK TESTS

To the Editor:—Please answer the following: 1. What is the significance of a positive Schick control test? 2. The significance of a positive Dick control test? 3. When the Schick test and Schick control are positive in patients who have never received active immunizations are these patients to be considered immune to diphtheria or should they receive a course of active immunization? 4. When the Dick test and Dick control are positive in patients who have never received active immunizations, are these patients to be considered immune to scarlet fever or should they receive a course of active immunization? 5. Will a positive Schick control test persist throughout the life of an individual? 6. Will a positive Dick control test persist throughout the life of an individual? In answering these questions kindly quote the source of information.

M.D., New York.

ANSWER.—1. A positive Schick control test is said to indicate sensitivity to the nonspecific protein in the Schick test material rather than susceptibility to diphtheria toxin.

2. There is no routine Dick control test (Rhoads, P. S.: Skin Tests and Immunizations Against Scarlet Fever and Diphtheria, THE JOURNAL, July 18, 1931, p. 153).

3. It is much safer to disregard a positive control test when testing persons for the first time, because it will be found that many so-called pseudoreactions will have become negative after immunization. If on retest following an adequate immunizing course the control test is as large, as bright and as indurated as the test made with unheated toxin, it is probably safe to call the retest a pseudoreaction (personal communication from the Dicks).

4. The Dicks advise against the routine use of a control test because the protein in Dick material is minimal. Pseudoreactions are so rare that the use of heated toxin or diluted medium control solution would lead to considerable confusion. Rarely a control may be useful in retesting persons who still have positive Dick tests after receiving much more toxin than the regular series of doses. In such persons, if heated skin test solution or medium control gives a test as large, as bright and as indurated as one made with regular Dick toxin, the Dick reaction may be a false positive. Such reactions are extremely rare.

5. A positive Schick control test will not always persist throughout the life of an individual. Many disappear after active immunization.

6. See answer 2.

PLACENTAL BLOOD TRANSFUSION

To the Editor:—In the editorial in THE JOURNAL, April 2, on "A New Source of Blood in Transfusion," you gave the formula used by the Moscow Institute of Hematology for a preservative of placental blood. You do not mention in what quantities it is to be added to the blood. Please give me this information if available. Also please let me know where I can get more detailed information concerning this subject, especially concerning the use of this blood in malignant conditions.

EDWARD J. MARTONE, M.D., Brooklyn.

ANSWER.—The formula of the diluting fluid recommended by the Moscow Institute of Hematology is as follows:

Sodium citrate	5.00 Gm.
Sodium chloride	7.00 Gm.
Potassium chloride	0.20 Gm.
Magnesium sulfate	0.004 Gm.
Distilled water	1,000.00 cc.

Blood is diluted with an equal quantity of fluid. This diluting fluid has been tried at the Blood Preservation Laboratory of the Cook County Hospital, Chicago, and has not been found superior to 70 cc. of the 2.5 per cent sodium citrate in physiologic solution of sodium chloride, which has been found adequate for the prevention of clotting of 500 cc. of blood.

There is probably no special advantage in the employment of blood transfusion in the treatment of malignant conditions excepting to the extent to which it may make it possible to tide a person over an operation.

POSSIBLE CONVULSIONS FROM DIPHTHERIA TOXOID

To the Editor:—A girl, aged 6, seen in consultation was in severe tetanic convulsions a day after her second diphtheria toxoid injection and had a severe local reaction. The day of the injection she had fever. Two weeks previously she had received a burn but no other injuries. She had never had convulsions previously. She was treated by the family physician by a hot enema and chloroform and gradually relaxed after one hour of a convulsive state. I did not see her subsequently but heard that she had a high fever for a week and then recovered. No other symptoms developed. Physical examination at the time of the convulsions was negative. The convulsions appeared similar to those seen in tetanus. What is your opinion as to the cause of the convulsion?

M.D., New Mexico.

ANSWER.—Although the possibility of tetanus infection associated with the burn might be considered, it does not seem to offer the correct explanation. The convulsions after the second dose of toxoid might be attributed to reaction, which was in the nature of an anaphylactic shock. Could not "the high fever for a week" be assigned to the "severe local reaction"? Severe local reactions after toxoid injections are not extremely rare. Constitutional reactions in older patients are fairly common.

PASSAGE OF TEST MEALS—INTESTINAL STASIS

To the Editor:—1. What is the normal length of time required for the passage of the barium sulfate meal through the gastro-intestinal tract? 2. Please discuss intestinal stasis and its treatment.

T. K. LEWIS, M.D., Birmingham, Ala.

ANSWER.—1. The time for passage of a barium sulfate meal through the gastro-intestinal tract will vary with the type of meal employed. A protein barium meal causes slight delay, a dextrose meal a moderate delay, and an olive oil meal a delay of about five hours. The times quoted below are for a standard water barium meal which consists of 5 ounces (150 Gm.) of barium sulfate and from 3 to 5 ounces (90 to 150 cc.) of water. The stomach empties in two hours and occasionally in from two and one-half to three hours, the small intestine in from two to four hours. Usually at four hours the head of the barium column enters the cecum, at the hepatic flexure of the colon in from six to seven hours, and at the splenic flexure in eight hours. Filling of the sigmoid is variable and may be between the ninth and the seventeenth hour. Usually at the

end of twelve hours the barium is evenly distributed from the cecum to the middle of the sigmoid. After twenty-four hours the largest part of the barium has reached the lower sigmoid and rectum and is evacuated.

2. This question is vague. Stasis may be acute or chronic and involve the small or large bowel or both. As the reply would be lengthy, reference should be made to Bassler's "Disease of the Intestines and Lower Alimentary Tract." It contains an excellent chapter on intestinal stasis in all its phases.

TAPEWORMS IN FISH—EFFECT OF KIPPERING AND SMOKING

To the Editor:—Have any of the fish of the state of Washington been known to harbor fish tapeworm? If so, does kippering and smoking kill these parasites?

M.D., Washington.

ANSWER.—No authentic record is known of the occurrence in the flesh of the fish of the state of Washington of the bladder worm or larval stages of the fish tapeworm, *Diphyllobothrium latum*, of man. However, a larval stage of an unknown fish tapeworm does occur in the flesh of trout and landlocked salmon in Washington, but the adult stage of this worm probably occurs normally in some fish-eating wild mammal. The process of kippering as ordinarily used does not kill the larval stages of the fish tapeworm in the flesh of the fish. It is reported that saturated brine applied for more than a month will destroy the larvae, provided the flesh is completely permeated by the brine. Larger fish and those with skins on are less readily penetrated than smaller ones. Smoking of fish as ordinarily carried on does not destroy the infective bladder worms in the flesh of the fish. The process of hot smoking if carried on for an hour or more at 75 C. is reported to destroy these larval stages.

BLADDER INJURY AFTER HYSTERECTOMY

To the Editor:—What may cause the bladder wall to become thin like tissue paper? Can you furnish any statistics on the percentage of bladder injuries following complete hysterectomies in the presence of so-called pus tubes?

M.D., Alabama.

ANSWER.—It is difficult to offer any explanation as to the thinning out of the bladder wall. Unfortunately it is impossible to quote any statistics regarding the percentage of bladder and ureteral injuries following complete hysterectomies. This is a subject that would be of great interest to the surgeon and should be reported in order that the newer generation of surgeons may appreciate the need for care as regards the ureters when doing pelvic surgery. It seems certain that these injuries do take place far more often than is usually recognized.

NO RELATION BETWEEN GARTERS AND CORONARY DISEASE

To the Editor:—There is a rumor that the wearing of men's garters will predispose to circulatory disturbances and in time lead to coronary trouble. I have never seen any evidence to support such a rumor. Is there anything in medical literature that shows a causal relationship between the wearing of men's garters and the disturbances I have mentioned?

WILLIAM J. TANNENBAUM, M.D., Chicago.

ANSWER.—No evidence has been obtained nor any reports found in the literature that the wearing of men's circular adjustable garters predisposes to coronary disease. If in a nonadjustable garter the pressure was great and distributed over a narrow area, the venous pressure distal to the constriction would be increased and there might be an aggravation of preexisting varicose veins.

DANGERS OF INTRAVENOUS THERAPY

To the Editor:—Dr. Joseph K. Narat's comment on page 1387 of THE JOURNAL, April 23, regarding the possibility of harm in the indiscriminate use of vitamin B_1 preparations (thiamin chloride) ought also to call for a comment on the indiscriminate use of the intravenous method of administration. The spectacularity of the intravenous route seems to be so fascinating that it is being used in an overwhelming number of instances when it is not necessary and in plenty of instances in which it is harmful. When a therapeutic agent acts perfectly well by the oral route, why court trouble by throwing it into the circulation? The number of emergencies in which the intravenous route is the only possible method of administration for vitamin B_1 hydrochloride, and countless other therapeutic agents is negligibly small. The throwing of a substance of which our knowledge is incomplete into a circulatory situation of which our knowledge is also incomplete brings about a combination out of which any reasoning person would anticipate trouble beforehand. The intravenous route should be limited to such aid as cannot be administered otherwise or to emergencies in which the possible danger is less than that of delay.

MILES J. BREUER, M.D., Lincoln, Neb.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 28. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ALASKA: Juneau, Sept. 6. Sec., Dr. W. W. Council, Box 561, Juneau.

ARIZONA: *Basic Science.* Tucson, June 21. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson. *Medical.* Phoenix, July 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: Little Rock, Nov. 3-4. Sec., State Medical Board of the Arkansas Medical Society, Dr. L. J. Kosminsky, Texarkana.

CALIFORNIA: *Reciprocity.* Los Angeles, July 11, San Francisco, Sept. 14, and Los Angeles, Nov. 16. *Written examinations.* San Francisco, June 27-30, Los Angeles, July 11-14, and Sacramento, Oct. 17-20. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, July 6-8. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Medical (Regular).* Hartford, July 12-13. *Endorsement.* Hartford, July 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Medical (Homeopathic).* Derby, July 12. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 12-14. *Reciprocity.* Dover, July 19. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, June 27-28. *Medical.* Washington, July 11-12. Asst. Sec., Commission on Licensure, Mr. Paul Foley, 203 District Bldg., Washington.

FLORIDA: Jacksonville, June 13-14. Sec., Dr. William M. Rowlett, Box 786, Tampa.

HAWAII: Honolulu, July 11-14. Sec., Dr. James A. Morgan, 48 Alexander Young Bldg., Honolulu.

IDAHO: Boise, Oct. 4-5. Commissioner of Law Enforcement, Hon. J. L. Balderston, 205 State House, Boise.

ILLINOIS: Chicago, June 28-July 1, and Oct. 18-20. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

INDIANA: Indianapolis, June 21-23. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

IOWA: *Basic Science.* Des Moines, July 12. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MAINE: Augusta, July 5-6. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical (Regular).* Baltimore, June 21-24. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, June 21-22. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 12-14. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: Ann Arbor and Detroit, June 13-15. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MINNESOTA: Minneapolis, June 21-23. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June 22-23. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: Helena, Oct. 4. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEVADA: *Reciprocity.* Carson City, Aug. 1. *Applications must be completed and on file by July 17.* Sec., Dr. John E. Worden, Capitol Bldg., Carson City.

NEW HAMPSHIRE: Concord, Sept. 15-16. Sec., Board of Registration in Medicine, Dr. Fred E. Clow, State House, Concord.

NEW JERSEY: Trenton, June 21-22. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 10-11. Sec., Dr. Le Grand Ward, 135 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York, and Syracuse, June 27-30 and Sept. 19-22. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 13. Sec., Dr. B. J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, July 5-8. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OREGON: *Medical.* Portland, June 21-23. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland. *Basic Science.* Corvallis, July 16 and Portland, Nov. 19. State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 5-9. Sec., Board of Medical Education and Licensure, Dr. James A. Newpher, 400 Education Bldg., Harrisburg.

RHODE ISLAND: Providence, July 7-8. Chief, Division of Examiners, Mr. Robert D. Wholey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 28. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Rapid City, July 19-20. Director of Medical Licensure, Dr. B. A. Dyar, State Board of Health, Pierre.

TENNESSEE: Knoxville, Memphis, and Nashville, June 15-16. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

TEXAS: San Antonio, June 20-22. Sec., Dr. T. J. Crowe, 918 Mercantile Bldg., Dallas.

VERMONT: Burlington, June 15-17. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 22-24. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WEST VIRGINIA: Elkins, July 4-6. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: Milwaukee, June 28-July 1. Sec., Dr. Henry J. Gramling, 2203 S. Layton Blvd., Milwaukee.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the *National Board of Medical Examiners* and *Special Boards* were published in THE JOURNAL, June 4, page 1947.

North Dakota January Examination

Dr. G. M. Williamson, secretary, North Dakota State Board of Medical Examiners, reports the oral, written and practical examination held at Grand Forks, Jan. 4-7, 1938. Ten candidates were examined, eight of whom passed and two failed. Four physicians were licensed by reciprocity and two physicians were licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine		(1932)	76.3
Loyola University School of Medicine		(1937)	77.5
Rush Medical College		(1936) 78, (1937)	84
University of Minnesota Medical School		(1935) 80, (1937)	75.7
University of Buffalo School of Medicine		(1928)	80.5
McGill University Faculty of Medicine		(1932)	77.4

School	FAILED	Year Grad.	Per Cent
College of Medical Evangelists		(1937)	71.9
University of Tennessee College of Medicine		(1931)	72.3

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School		(1936)	Illinois
University of Illinois College of Medicine		(1922)	Illinois
Indiana University School of Medicine		(1932)	Indiana
University of Texas School of Medicine		(1924)	Texas

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1937)	N. B. M. Ex.
University of Louisville School of Medicine		(1934)	N. B. M. Ex.

New York Endorsement Report

Mr. Herbert J. Hamilton, chief, Professional Examinations Bureau, reports 80 physicians licensed by endorsement from January 1 through February 28, 1938. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Arkansas School of Medicine		(1929)	Arkansas
Yale University School of Medicine		(1934), (1935), (1936)	N. B. M. Ex.
Georgetown University School of Medicine		(1935)	N. B. M. Ex., (1930, 2), (1936) New Jersey
Howard University College of Medicine		(1931)	Virginia, (1935, 2) North Carolina, (1935) Tennessee
Emory University School of Medicine		(1930)	Georgia
Indiana University School of Medicine		(1936)	Indiana
University of Louisville School of Medicine		(1924)	Kentucky
Johns Hopkins University School of Medicine		(1937)	Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons		(1937, 3)	Maryland
Harvard University Medical School		(1935), (1936)	N. B. M. Ex.
Tufts College Medical School		(1932), (1936)	N. B. M. Ex.
University of Michigan Medical School		(1934)	N. B. M. Ex.
University of Minnesota Medical School		(1934), (1937)	Minnesota
Washington University School of Medicine		(1931) (1936) New Jersey	Missouri,
Creighton University School of Medicine		(1936)	Indiana
Nebraska School of Medicine		(1896)	Mass.
University of Nebraska College of Medicine		(1914)	Nebraska
Albany Medical College		(1936)	N. B. M. Ex.
Columbia University College of Physicians and Surgeons		(1934), (1936)	N. B. M. Ex.
Cornell University Medical College		(1934), (1935)	N. B. M. Ex.
Long Island College of Medicine		(1934)	N. B. M. Ex.
New York Medical College and Flower Hospital		(1936)	N. B. M. Ex.
New York University College of Medicine		(1936, 2)	N. B. M. Ex.
Duke University School of Medicine		(1935)	N. B. M. Ex.
Western Reserve University School of Medicine		(1933)	Ohio
University of Pennsylvania School of Medicine		(1930)	Penna.
Meharry Medical College		(1937)	Tennessee
University of Tennessee College of Medicine		(1932)	Tennessee
Vanderbilt University School of Medicine		(1937)	Tennessee
Baylor University College of Medicine		(1925), (1936), (1937)	Texas
University of Vermont College of Medicine		(1929) (1936) N. B. M. Ex.	Vermont,
Medical College of Virginia		(1936)	Virginia
University of Virginia Department of Medicine		(1937)	Virginia
Dalhousie University Faculty of Medicine		(1935)	New Jersey
Queen's University Faculty of Medicine		(1933)	Wisconsin
University of Toronto Faculty of Medicine		(1916)	Wisconsin
McGill University Faculty of Medicine		(1934), (1935), (1936)	N. B. M. Ex.
Universidad de la Habana Facultad de Medicina y Farmacia		(1926)	Maryland
Christian-Albrechts-Universität Medizinische Fakultät, Kiel		(1925), (1926)	Germany
Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen		(1916)	Germany
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1936)	Texas
Hessische Ludwigs-Universität Medizinische Fakultät, Giessen		(1922)	Germany
Ludwig-Maximilians-Universität Medizinische Fakultät, München		(1901)	Germany
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn		(1919)	Germany
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia		(1935)	Maryland
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia		(1934, 2), (1935, 2) (1935), (1936, 2)	New Jersey, Maryland
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1934) (1924), (1935)	Maryland, New Jersey
Universität Bern Medizinische Fakultät		(1934)	N. B. M. Ex.
Université de Genève Faculté de Médecine		(1936)	N. B. M. Ex.

Book Notices

Diseases of Women for the General Practitioner. By Paul Titus, Obstetrician and Gynecologist to the St. Margaret Memorial Hospital, Pittsburgh. National Medical Monographs. Edited by Morris Fishbein, M.D. Cloth. Price, $3. Pp. 320, with 55 illustrations. New York: National Medical Book Co., Inc., 1937.

This new member of the national medical monograph series is all that its name implies. It is simply, clearly and tersely written, presenting the whole subject of gynecology from the point of view of the general practitioner. Special emphasis is laid on accurate and early diagnosis, especially in the sections on carcinoma of the cervix and uterus and in the chapter on ectopic pregnancy. Operative procedures and microscopic pathology are properly omitted. The office treatment of ambulatory patients is emphasized, since, as the author states, "the greatest bulk of gynecologic practice is nonoperative." The introductory chapter describing the necessary supplies and instruments is excellent. The chapter on anatomy and physiology is simply and clearly written, but it is to be regretted that the author has seen fit to describe "rhythmic birth control" as factual and accurate. It is hoped that in the succeeding editions the author will place more emphasis on the relationship of the general physical condition to gynecologic problems, and that routine complete physical examinations will be stressed; that hypothyroidism will be mentioned in connection with the discussion on menorrhagia, since this is one of the most common etiologic factors; that the recommended use of Goodell dilators be omitted; and, finally, that the section on anesthesia carry a statement on some type of anesthesia other than the combination of rectal anesthesia, nitrous oxide and ether. In these days when ethylene, cyclopropane and other inhalation anesthetics give such safe and satisfactory results, it seems unnecessary to many to use a combined routine as recommended by the author. The chapter on sterility and its management is an excellent summary of the present day position and management of the sterile couple and can serve as a perfect guide for the general practitioner. The illustrations are adequate. All in all, this volume is an excellent textbook on nonoperative gynecology and is to be highly recommended to every general practitioner.

Elements of Chromotherapy: The Administration of Ultra-Violet, Infra-Red and Luminous Rays Through Colour-Filters. By R. Douglas Howat, L.R.C.P., L.R.C.S., L.R.F.P.S. With foreword by Sir Henry Gauvain, M.D., M.Chir., F.R.C.S. Cloth. Price, 8s. 6d. Pp. 106, with 21 illustrations. London: Actinic Press, Ltd., 1938.

This small book deals with the use of visible and invisible light rays through colored filters. There are chapters devoted to history, physics, erythema, action on bacteria, filters, lamps, technic and clinical observations. The author advocates the use of visible light through colored filters and makes many extravagant claims for the value of such radiations. Because of the fact that practically all modern experts in light therapy have considered that the use of colored lights can have no other effect on the human body than a psychic one, and because a noted authority on the physics of light, W. W. Coblentz of the Bureau of Standards of the United States government and member of the Council on Physical Therapy of the American Medical Association, has said "If the rays in the visible spectrum have any special therapeutic action, it remains to be determined," this textbook was reviewed with considerable care to determine whether the author had any new material to offer which might alter the generally accepted views on the subject and might justify his statement that chromotherapy was of value.

On superficial examination of the author's chapter on the action of color rays on bacteria, the impression is obtained that a rather imposing array of direct quotations has been presented

to support the author's views. However, when one carefully checks the brief bibliography which has been appended to the book, it is found that a number of the sources of references have not been given and that those that are given are not in any sense new and advanced ideas but on the contrary are extremely antiquated. For example, in the chapter cited which deals with the action of color rays on bacteria, the references that were given were dated 1877, 1904, 1858, 1883, 1879, 1889 and 1903. Such outdated material, all of it over 25 years of age, of course merits no serious consideration in a modern textbook and is of interest only from a historical standpoint. A check of the bibliography for the entire book shows that twenty-one of the forty-five references are articles written more than twenty-five years ago. The author bases his contentions on such obsolete material and on twenty-five sketchy case reports, all of which are presented in a highly unscientific manner. Typical of these case reports is the first one, which describes the treatment of "acidity" by application of a "red filter over epigastrium for fifteen minutes." The author reported that after a dozen treatments the patient "was absolutely free from symptoms and declared that she had never felt so fit."

The reviewer feels that it is such unscientific outmoded presentations which hamper the rapid growth of an extremely important field of medicine. The reading of such books creates in the mind of the average physician an unjustified critical attitude toward the entire field of physical therapy. The wide distribution of this book will probably hamper rather than aid the cause of physical therapy. The reviewer is rather amazed that a medical man could write such an unscientific textbook and that one so famed as Sir Henry Gauvain should be willing to lend his name to its publication. This textbook is not recommended.

Religion and Medicine of the Gã People. By M. J. Field. Cloth. Price, $6.50. Pp. 214, with 31 illustrations. New York, London & Toronto: Oxford University Press, 1937.

The Gã people occupy parts of the Gold Coast region of western Africa, and the present volume is the result of a number of years of studies of the tribe by the author. The work gained the author a doctorate at the London University. Of its three parts the second deals with the principles and practice of medicine (and magic). These are almost wholly conditioned by the basic concepts by the Gã of the human being. This they hold is compounded of three entities—the *susuma*, or personality, spirit or soul; the *kla*, corresponding to life, and the material *body*. On the complex actions and interactions of these principles, and on the influences on them of spirits and witches, are based the conceptions and treatment of all disorders the cause and course of which are not plainly obvious. A chapter of the book deals with interesting hysterical manifestations among the people and with mediums, another with the medicine men and the means they use for curative purposes. In finding the causes of disease, diagnosis, prognosis and treatment there is an occasional spark of common sense, but the essentials are involved thaumaturgic ideas and practices, all of which to a medical man among ourselves is interesting mainly as a suggestion of what may have been the views and practices among our own faraway ancestry.

Traumatismes de l'oreille. Fractures du rocher—coups de feu de l'oreille, commotions labyrinthiques, expertises en otologie. Par J. A. Ramadier, oto-rhino-laryngologiste de l'Hôpital de la Pitié, et R. Caussé, assistant d'oto-rhino-laryngologie des hôpitaux de Paris. Paper. Price, 45 francs. Pp. 150, with 15 illustrations. Paris: Masson & Cie, 1937.

This excellent monograph presents the subject of trauma to the auditory apparatus in detailed, clear and concise fashion. Most of the text is based on the authors' own experience, yet the conclusions are drawn only after due consideration of the opinions of other observers. The subject matter is aptly divided into five sections: (1) trauma to the external ear, the drum and the tympanic cavity; (2) fractures of the auricular skeleton; (3) injury by firearms; (4) commotio labyrinthi, and (5) medicolegal aspects. Thus every phase of the topic is covered. The authors attempt to group the symptoms and diagnostic signs in such a fashion as to make the indications for treatment clear. Yet it is conceded that while this may look well on paper, in actual practice one may find that certain cases overlap and do not readily fall within the given classification. However, the method is a good one since it brings to the fore the cardinal principles on which safe conduct of the case depends. The discussion of commotio labyrinthi is an interesting one and the authors take great pains to offer every possible bit of advice that may be useful in distinguishing the simple subjective type which gets well spontaneously from the type in which there are definite objective manifestations. In the chapter on the medicolegal aspects of trauma the authors discuss thoroughly the questions of degree of disability, prognosis and malingering and describe in detail the numerous tests. Even true and false tinnitus are given attention. The book is adequately illustrated by reproductions of histologic sections and roentgenograms, the value of which is greatly enhanced by the accompanying explanatory diagrams. In the chapters on surgical treatment one finds Ramadier quite at home, since his approach to the petrous apex by way of the carotid canal is now a well accepted procedure and is in this connection modified to meet the conditions. It is safe to say that this little volume will be well appreciated by otologists as well as general surgeons who are interested in traumatic surgery.

Alkali Disease or Selenium Poisoning. By Alvin L. Moxon. South Dakota State College of Agriculture and Mechanic Arts, Agricultural Experiment Station, Department of Experiment Station Chemistry. Bulletin 311. Paper. Pp. 91, with 26 illustrations. Brookings, S. D., 1937.

Although, as the author points out, the term "alkali disease" is essentially a misnomer, it remains in use and probably will be retained to designate the specific type of selenium poisoning to which it was originally applied. This monograph contains an excellent brief historical review of the development of knowledge of this disease and includes an interesting quotation suggesting that Marco Polo might have referred to alkali disease. The subsequent portion is devoted principally to the study of the disease in live stock and poultry, including a considerable number of interesting original experiments. There is little reference to the selenium problem so far as it might affect human beings but the author concludes that in certain sections the selenium problem has proved a serious handicap to agricultural development. This study serves as a useful addition to the rapidly increasing literature on selenium poisoning.

Therapie der Tuberkulose. Herausgegeben von Prof. Dr. J. Berberich und Dozent Dr. P. Spiro. Bearbeitet von J. Van Assen et al. Bände I und II. Paper. Price, 25 florins per set. Pp. 324, with 11 illustrations; 327-845, with 3 illustrations. Leiden: A. W. Sijthoff's Uitgeversmaatschappij N. V., 1937.

The contributions of investigators of tuberculosis during the past decade has reflected itself in new views on therapy, especially the view that tuberculosis is not a disease of an individual organ or organ system but of the organism as a whole, which has led to the necessity for treating the tuberculous human being. The desire of the practitioner to possess such an encompassing summary, which even the specialist of best intentions cannot keep abreast of today because of the extensiveness of the field, inspired these volumes. The first volume concerns itself with the general problems, the second with special fields of tuberculosis therapy. Collaborators from many different countries have made the volumes diversified and added materially to their value. A critical sketch of therapy in modern times is presented as the introduction by the master of therapy in tuberculosis, Prof. Albert Fraenkel of Heidelberg. Modern phthisiology and phthisiotherapy are characterized by the transition from empiric intuition to pathologic-clinical knowledge. The chapters in volume 1 include the biology and determination of the tubercle bacilli; immunity, including the natural and specific immune factors and the influence of nonspecific stimulants on specific immune processes (antigens and antibodies are discussed); the pathogenesis, the morphology and the allergic relations of the healing processes in tuberculosis; a chapter on the anatomic and experimental observations with therapeutic tests (animal); control of the course of tuberculosis; therapy by roentgenograms; tuberculin diagnosis; tuberculin therapy; protective immunization with tuberculin and BCG; tuberculosis as a chronic disease and the social hygienic treatment, and chemotherapy and vocational therapy. Volume 2 is introduced by a consideration of tuberculosis of the upper air passages followed by chapters on the therapy of pulmonary tuberculosis, surgery of pulmonary tuberculosis and the therapy of miliary tuberculosis. The organic systems are further considered as

cardiac and circulatory, gastrointestinal, lymph glandular, bone and joint, and so on, while lymphogranulomatosis, tuberculosis and diabetes mellitus are appropriately considered. The therapy of tuberculosis of childhood and of the aged is not neglected, and finally pregnancy, and psychology and psychotherapy are discussed. A valuable feature is the extensive bibliography at the end of each chapter, where it is readily accessible to use if desired. The list of notable collaborators attests the high quality of the contents, which include, besides the authors, Ernst Brieger, Albert Fraenkel, Julius Hollo of Budapest, Walter Pagel, Arvid Wallgren of Gotenburg and others. The volumes are paper covered, well printed, substantially bound, and suitably illustrated. There is an author and subject index at the end of volume 2. For those who are able to read German fairly fluently, these volumes should make a valuable addition to a practical library, although—and this is no criticism—heavily flavored with European views. The specialist in internal medicine and tuberculosis and the student of medicine will find much valuable information in these volumes which, though stressing therapy, do not do so at the expense of information on tuberculosis in general but weave therapy into the picture based on fundamental knowledge of tuberculosis of the newer types. It is refreshing to admit that there is a comprehensive textbook which could be critized by the exacting investigator but which contains so much valuable material that it might be then signified as possible individual prejudice. The volumes merit an extensive circulation.

Digestive Tract Pain; Diagnosis and Treatment: Experimental Observations. By Chester M. Jones, M.D., Assistant Professor of Medicine, Harvard University. Cloth. Price, $2.50. Pp. 152, with 5 illustrations. New York: Macmillan Company, 1938.

This book is brief but well written and has a few important illustrations. The disturbances of the digestive tract and their diagnosis and treatment are approached principally by an analysis of pain, the chief symptom. The author has concisely presented his experimental observations on pain, produced at various levels of the digestive tract in normal and abnormal states. The clinical application of these experimental observations is then discussed. This discussion is amplified by a series of case reports, which are not only interesting but strikingly illustrative of the principal theme of the author: the importance of pain in the digestive tract. The author has not failed to recognize the importance of gastrointestinal pain in "functional disease." This chapter likewise is well illustrated by case histories. The final chapter is an excellent summary and contains many important therapeutic considerations which show a well ordered conception of the manifold problems of the digestive disorders. The author has indeed presented a concise monograph which should stimulate the gastro-enterologist to continue similar experimental and clinical observations and should likewise be revealing to the general practitioner of the newer concepts of gastrointestinal diseases.

Febrile Episoden bei schizophrenen Psychosen: Eine klinische und pathophysiologische Studie. Von Dr. med. habil. K. F. Scheid, Oberarzt der psychiatrischen Abteilung des städtischen Krankenhauses, München-Schwabing. Boards. Price, 7.80 marks. Pp. 97, with 7 illustrations. Leipzig: Georg Thieme, 1937.

The author presents a study of a small series of psychoses classified as schizophrenic, with conspicuous somatic disturbances, especially fever, cyanosis and tachycardia. Detailed analysis of the changes in the blood picture, blood chemistry and cerebrospinal fluid were made in an attempt to discover the etiologic pathophysiologic process. The cases were selected to exclude all those in which any known exogenous toxic or infectious factors might be present. In the first group of febrile cyanotic psychoses, all acute or subacute, lasting from a few days to a few months, all terminating in coma and death, no adequate explanation of the disease was found at necropsy except dilatation of the heart and venous stasis. In all these cases, as in the cases of febrile and subfebrile episodes during the course of protracted schizophrenic psychoses, the author finds certain changes in the cellular and chemical constituents of the blood indicating a hemolytic process. He concludes from a study of his material that there is a causal relationship between the destruction of blood corpuscles (hemolysis) and these schizophrenic psychoses.

Treatment by Diet. By Clifford J. Barborka, B.S., M.S., M.D., Department of Medicine, Northwestern University Medical School, Chicago. Third edition. Cloth. Price, $5. Pp. 642, with 8 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1937.

In this edition some errors have been corrected from the first two editions and articles have been added on the present status of the clinical aspects of the vitamins and the present conception of the use of protamine zinc insulin. This volume fails to take account, however, of the newer discoveries in the field of the vitamins which indicate the chemical nature of these substances. The vast majority of the book consists of tables of food substances, providing diets for all sorts of medical conditions. In the appendix there are additional tabular data related to weights, measures and recipes, and there is also an extensive bibliography. The book serves well as a reference work for the practitioner who simply will not take the time to acquaint himself with the basic information regarding nutrition and diet but who wants to use the results of such considerations.

Speech Training for Cases of Cleft Palate. By M. C. Oldfield, M.Ch., F.R.C.S. Cloth. Price, 4s. 6d. Pp. 18, with 38 illustrations. London: H. K. Lewis & Co., Ltd., 1938.

The title of this book gives promise of more than is actually forthcoming. The material is distinctly disappointing, not because of any intrinsic lack of worth but because of its brevity and sketchy presentation. Of the eighteen pages in the book, two are devoted to an introduction, four to photographs (the most interesting aspect of the book), and the remaining twelve pages to a tabulation of the various speech sounds, with illustrative diagrams and a few simple exercises—all of which may be found in almost any general book on speech. While the author is undoubtedly sincere in her attempt to give the reader the benefit of her own practical experience, which is commendable, a book usually is written to give as complete a presentation of the subject as possible. Actually, the present work is merely a pamphlet elevated to book dignity by having stiff covers. The same material has been presented before and in much greater detail. The book really recommends itself only because of its eight photographs. The speech therapist or interested layman who wishes to gain a more comprehensive knowledge of the subject will undoubtedly have to supplement the volume with other reading.

A Textbook of Hematology. By William Magner, M.D., D.P.H., Pathologist, Saint Michael's Hospital, Toronto, Canada. Cloth. Price, $4.50. Pp. 395, with 26 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1938.

The author has attempted to describe fully but concisely the clinical features of disorders of the hemopoietic system and the associated changes in the blood and tissues. This objective has necessitated much simplification without attendant inaccuracy, and on the whole the author has met this problem successfully. The controversial features of terminology have been discussed briefly and fairly. The book is not profusely illustrated and for laboratory use it probably would have to be supplemented by a hematologic atlas. Beginning students of the blood and nonspecializing clinicians may find this a useful addition to their libraries.

Experimentelle Bakteriologie und Infektionskrankheiten mit besonderer Berücksichtigung der Immunitätslehre. Von W. Kolle und H. Hetsch. Unter Mitarbeit von Prof. Dr. H. Schlossberger. Herausgegeben von Prof. Dr. H. Hetsch. Eighth edition. Paper. Price, 30 marks. Pp. 836, with 92 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1938.

This is a monumental work. Originally presented by Professors Kolle and Hetsch with the assistance of Professor Schlossberger, it now appears under the editorship of Professor Hetsch, Professor Kolle having died some time ago. The present edition covers nearly every phase of bacteriology, virus diseases and the more important tropical diseases. Each disease is discussed under a separate chapter and the important bacteriologic technical details are given, also the important symptomatology, and a short pathologic discussion of the disease. There are excellent colored plates of smear and culture preparations and numerous black and white reproductions. At the end of each chapter there is a bibliography. Important references to the American literature has been omitted. In the section on virus diseases there is no mention of the work done by Dr. Rivers of the Rockefeller Institute in this country. The important work on streptococci by Dr. Lancefield is not

presented. This book can be highly recommended to the bacteriologist, immunologist and public health worker as well as the student in bacteriology who is interested in a more detailed presentation of the subject.

My Scrapbook of Medicine. By Louis R. Effler, A.M., M.D., F.A.C.S. With Bibliography and Index. Cloth. Price, $3. Pp. 248. Toledo, Ohio: McManus-Troup Company, 1937.

This privately published work includes a series of items in prose and in verse collected by the author from various places. Most of the references concern the history of medicine. Some of them are taken from newspaper clippings. The book is printed in mixed deep black and light black type, which makes it difficult to read. In any event, however, it is the kind of book that one picks up for occasional scraps of interesting material rather than as sustained reading matter.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Conviction Under Harrison Narcotic Act a Felony and Involves Moral Turpitude.—The medical practice act of Texas authorizes any court of competent jurisdiction to revoke a license to practice medicine if the licentiate has been found guilty of a felony or of a crime involving moral turpitude. The appellant, a physician, was convicted in the United States district court for the southern district of Texas of violating the Harrison Narcotic Act, he having confessed to the sale of narcotics to an addict. Thereafter the state, on relation of the state board of medical examiners, instituted appropriate proceedings to revoke the appellant's license. The license was revoked and the physician appealed to the court of civil appeals of Texas, Galveston.

The appellant contended that the offense for which he had been convicted was then a felony under the laws of the United States but not under the laws of Texas, and that before his license to practice could be revoked it had to be shown that he had been convicted of an offense which was then a felony under the state laws. But, the court said, the medical practice act does not require, in order to justify the revocation of a license to practice medicine, that the holder be convicted of an offense of the grade of a felony in Texas, but only of an offense that was of the grade of a felony anywhere. Since the conviction of a violation of the Harrison Narcotic Act constitutes a felony, it was plain to the court that the revocation of the appellant's license was justified because of that conviction.

That moral turpitude inhered in the acts from which the conviction resulted was, in the opinion of the court, a legitimate, if not inevitable, inference. The appellant apparently argued that, since the Harrison Narcotic Act was a revenue measure only, a violation of it does not involve moral turpitude. But, said the court, while the Harrison Narcotic Act does have that character so far as may be necessary to uphold the power of Congress under the constitution in enacting it, its further and underlying purpose is to regulate and control the sale of narcotics in consonance with a widespread feeling that it is not good morals to sell such dangerous drugs except in pursuance of the professional ministrations of a physician in treating patients. The record showed not only that the appellant was convicted in the federal court for selling morphine unlawfully but that he was also convicted of smuggling narcotics into the United States. Even though the sale by itself should not be considered a crime involving moral turpitude, the court thought that smuggling is so regarded.

The trial court committed no error in refusing to submit to the jury the question of whether or not the appellant's right to practice medicine in Texas should be canceled. That, obviously, was a question of law for the court.

The appellate court having found no error in the record, the judgment of revocation was affirmed.—*Speer v. State (Texas), 109 S. W. (2d) 1150.*

Contracts: Agreements in Restraint of Medical Practice Valid If Reasonable.—Two young physicians, the appellants in this case, as a part of a contract of employment entered into with several physicians composing a partnership, agreed that if they, the appellants, terminated the contract they would not within five years from the date of such termination engage in practice in the community or within five miles of its corporate limits. A disagreement arose, the two physicians withdrew from the employment and each entered independently on the practice of medicine in the community. The physicians composing the partnership, the appellees, then instituted proceedings to enjoin the appellants from engaging in practice in contravention of their agreement. The trial court issued the injunction and the enjoined physicians appealed to the Supreme Court of Mississippi, contending that their promise not to practice their profession in the community or within five miles thereof for five years was unenforceable.

It is well settled, said the court, that "a bargain by an assistant, servant, or agent not to compete with his employer, or principal, during the term of the employment or agency, or thereafter, within such territory and during such time as may be reasonably necessary for the protection of the employer or principal, without imposing undue hardship on the employee or agent," is valid "unless effecting, or forming part of a plan to effect, a monopoly." *2 Rest. Contracts, Sec. 516.* In the present case, the court pointed out, the limitation of time and space was undoubtedly reasonable, and the evidence disclosed that the public interest would not suffer by an enforcement of the agreement, for the number of physicians in the community was amply sufficient to render necessary medical services to the citizens. No monopoly was either contemplated by the contract or would result from its enforcement.

To enable the physicians forming the partnership to enforce the agreement of the appellants by means of an injunction, it must appear, the court said, that the former performed their obligations under the contract. They would not be entitled to an injunction if they failed to perform their part of the bargain and thereby caused the withdrawal of the appellants from their service. But such did not occur here. The physicians forming the partnership acceded to every demand made on them by the appellants and at no time indicated that they would not perform their obligations under the contract. This being true, there was no default on the part of the partnership physicians which justified the appellants in the course they took.

Finding no error in the judgment of the trial court, the Supreme Court affirmed that judgment enjoining the appellants from engaging in the practice of medicine contrary to the agreement they made.—*Wilson v. Gamble (Miss.), 177 So. 363.*

Society Proceedings

COMING MEETINGS

American Medical Association, San Francisco, June 13-17. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.

American Academy of Tuberculosis Physicians, San Francisco, June 17-18. Dr. Arnold Minnig, 638 Metropolitan Bldg., Denver, Secretary.

American Association of Medical Milk Commissions, San Francisco, June 13-14. Dr. Paul B. Cassidy, 2037 Pine St., Philadelphia, Secretary.

American Medical Women's Association, San Francisco, June 12-14. Dr. Helen A. Cary, 1634 N.E. Halsey St., Portland, Ore., Secretary.

American Proctologic Society, San Francisco, June 11-13. Dr. Curtice Rosser, 710 Medical Arts Bldg., Dallas, Texas, Secretary.

American Radium Society, San Francisco, June 13-14. Dr. F. W. O'Brien, 465 Beacon St., Boston, Secretary.

American Rheumatism Association, San Francisco, June 13. Dr. Loring T. Swaim, 372 Marlborough St., Boston, Secretary.

American Urological Association, Quebec, Canada, June 27-30. Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.

Association for the Study of Internal Secretions, San Francisco, June 13-14. Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.

Maine Medical Association, Bar Harbor, June 26-28. Dr. F. R. Carter, 22 Arsenal St., Portland, Secretary.

Medical Library Association, Boston, June 28-30. Miss Janet Doe, 2 East 103d St., New York, Secretary.

Minnesota State Medical Association, Duluth, June 29-July 1. Dr. E. A. Meyerding, 11 West Summit Ave., St. Paul, Secretary.

National Tuberculosis Association, Los Angeles, June 20-23. Dr. Charles J. Hatfield, 7th and Lombard Sts., Philadelphia, Secretary.

West Virginia State Medical Association, White Sulphur Springs, July 11-13. Mr. Joe W. Savage, Public Library Building, Charleston, Executive Secretary.

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Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

15: 385-514 (April) 1938

*Causes of Death in Patients with Congestive Heart Failure. R. H. Williams and J. Rainey, Nashville, Tenn.—p. 385.

*Some Problems in Diagnosis, Prognosis and Treatment of Acute Arterial Occlusion. H. E. Rykert and D. Graham, Toronto, Canada.—p. 395.

Electrogram of Cardiac Muscle: II. Lengths of Stages of Activity. A. G. Macleod, New York.—p. 402.

Ventricular Deflections in Myocardial Infarction: Electrocardiographic Study Using Esophageal and Precordial Leads. J. G. M. Hamilton and J. Nyboer, Boston.—p. 414.

Comparative Effects of Water Baths and Mustard Baths at Varying Temperatures on Rate of Peripheral Blood Flow in Man. J. A. Killian and C. A. Oclassen, New York.—p. 425.

*Electrocardiographic Changes Found in Twenty-Two Cases of Carbon Monoxide (Illuminating Gas) Poisoning. W. H. Stearns, C. K. Drinker and T. J. Shaughnessy, Boston.—p. 434.

Blood Pressure and Size of Cardiac Infarct. Janet Travell, H. Gold and W. Modell, New York.—p. 448.

Coronary Vasoconstrictor Action of Foreign Species Blood. L. N. Katz, W. Weinstein and K. Jochim, Chicago.—p. 452.

Occlusion of Coronary Arteries by Hemorrhage into Their Walls. W. B. Wartman, Cleveland.—p. 459.

Study of Electrical Activity in Auricles. D. I. Abramson, N. M. Fenichel and C. Shookhoff, Brooklyn.—p. 471.

Congenital Transposition of the Great Arterial Trunks. D. W. Ingham and F. A. Willius, Rochester, Minn.—p. 482.

Causes of Death in Congestive Heart Failure.—Williams and Rainey analyzed the records of 185 patients who gave a convincing history of congestive heart failure and who died and were subjected to postmortem examination at the Vanderbilt University Hospital during 1926 to 1935. In recent years the life of patients who suffer from congestive heart failure has been definitely increased. This increase seems best accounted for by the more effective control of congestive failure, through the intensive use of mercurial and xanthine diuretics. Death from congestive heart failure and from pulmonary embolism and infarction distinctly decreased in frequency during the period 1931 to 1935. During this period pneumonia, both as a primary and as a supplementary cause of death, increased in frequency, particularly in patients with arteriosclerotic disease. Intensive treatment with salyrgan did not increase the incidence of uremia in the nonhypertensive patients. Uremia occurred with increased frequency in the 1931-1935 hypertensive group as compared with the 1926-1930 group. Whether the increased incidence of uremia in the subjects with hypertensive cardiac disease was due entirely to the prolonged life which resulted from improvement in the treatment of cardiac disease, thus allowing progression of renal damage to occur, or whether in some instances the mercurial diuretics actually favored progression of renal disease cannot be stated with certainty.

Acute Arterial Occlusion.—In a series of thirty-six cases of acute embolic occlusion, Rykert and Graham observed that pain was present as the initial complaint in 64 per cent of cases, was of maximal severity at the onset in 53 per cent and was present in the later stages of the condition in 100 per cent of cases. Pain of maximal severity at the onset usually was located at the level of the occlusion and less often in the distal part of the affected limb, and pain present in the later stages of the condition was always located distal to the site of the occlusion. Arteriotomy provides the only means whereby the obstruction may be removed and the continuity of the occluded artery restored. This is possible only in acute arterial occlusions due to emboli. The satisfactory immediate results following early operation in a considerable percentage of cases of acute embolic occlusion made embolectomy the accepted method of treatment in this condition. Too much stress has been laid on the satisfactory results that may follow early operation and too little attention has been paid to the late results following embolectomy and to the percentage of spontaneous recovery of the circulation following acute arterial occlusion. In the thirty-six cases of complete occlusion, of the common femoral artery in twenty and of the popliteal artery in sixteen, spontaneous recovery of the circulation occurred in approximately 20 per cent of each group. When acute embolic occlusion of the arteries of the upper extremities occurs in patients not suffering from severe failure of the general circulation, spontaneous recovery would appear to be the rule rather than the exception. The primary disease and not the immediate restoration of the peripheral circulation is the important factor in determining the late prognosis in acute arterial occlusion. As the primary disease is of so much importance in both the causation and the prognosis of acute arterial occlusion from thrombosis and embolism, treatment directed toward the early restoration of the circulation by measures other than embolectomy would seem to be indicated. Alternate suction and pressure therapy has the advantage of being applicable to cases of thrombosis as well as of embolism, and in the treatment of the latter is not limited by the duration of the occlusion.

Electrocardiographic Changes in Carbon Monoxide Poisoning.—In their series of twenty-two cases of carbon monoxide asphyxia, Stearns and his associates found that the most common electrocardiographic deviation is an abnormality in the T waves or in the level of the ST segment; there were eighteen such cases. Four patients showed paroxysmal auricular fibrillation and one showed transitory intraventricular block. Two showed ventricular premature contractions and one auricular premature contractions. Low voltage on the initial electrocardiogram, later improving or returning to normal, was present in five. Variations in the P waves occurred in two. All the patients were admitted directly to the emergency ward on their arrival at the hospital. However, before being removed from the scene of their asphyxiation they had been treated with inhalations of 7 per cent carbon dioxide and 93 per cent oxygen for varying lengths of time. The authors feel that the changes, having been transitory, may be ascribed directly to the carbon monoxide asphyxia, except when coronary disease may have been a contributing cause in some cases. They limit their study to the period of recovery from the marked anoxemia after emergency oxygen and carbon dioxide treatment. The results, while indicating that intraventricular block may result from carbon monoxide poisoning, suggest that this is not the usual outcome.

American Journal of Diseases of Children, Chicago

55: 667-896 (April) 1938

Acute Laryngotracheobronchitis. J. Brennemann, W. M. Clifton, A. Frank and P. Holinger, Chicago.—p. 667.

Tonic Neck Reflexes in Children Considered from Prognostic Standpoint. R. K. Byers, Boston.—p. 696.

Hysterical Blindness in Children: Report of Two Cases. E. Wolff and G. S. Lachman, San Francisco.—p. 743.

*Nutritional Heart Disease in Children. J. I. Waring, Charleston, S. C. —p. 750.

Congenital Heart Disease: Clinical and Postmortem Study of 105 Cases. S. Gibson and W. M. Clifton, Chicago.—p. 761.

*Prophylaxis Against Measles with Globulin Fraction of Immune Human Adult Serum. S. Karelitz, New York.—p. 768.

Hemoglobin Differences in Healthy White and Negro Infants. Betty Munday, M. L. Shepherd, Louise Emerson, B. M. Hamil, M. W. Poole and Icie G. Macy, Detroit, and T. E. Raiford, Ann Arbor, Mich.—p. 776.

Primary Carcinoma of Liver in Childhood: Report of Two Cases, with Critical Review of Literature. M. M. Steiner, Brooklyn.—p. 807.

Nutritional Heart Disease in Children.—Waring presents thirteen cases of cardiac disturbances of nutritional origin. The diagnosis of nutritional cardiac disease was made on the basis of the following observations: cardiac enlargement, shown by percussion and by roentgen examination, without accompanying murmur; negative results of urinalyses; absence or sluggishness of reflexes; a history of deficient diet, and a more or less rapid response to rest and sufficient food. Dietetic histories in most cases were vague, but malnutrition was generally evident. Twelve of the thirteen patients were Negro children aged from 14 to 48 months. The cause of cardiac enlargement does not appear in these cases. Whether deficiency of vitamin B_1, deficiency of protein or general dietetic deficiency

is the fundamental cause is still a matter of some disagreement. All the patients improved on adequate diets strengthened with materials rich in vitamin B_1. It appears that the cardiac changes are not entirely due to a lack of vitamin B_1 but to a rather more general deficiency of dietary materials and that a satisfactory response to dietetic treatment may be expected in cases in which the illness is not too far advanced.

Prophylaxis Against Measles.—Karelitz recommends further trial of the globulin fraction of immune adult serum in the prophylaxis of measles for the following reasons: 1. It has been efficacious in doses easily calculated from the known indicated doses of immune adult serum. 2. It is easily prepared from immune adult blood. 3. The amount of the injection is small compared with the amount of immune adult serum injected, and the serum may be prepared so that the dosage is equal to or less than that of measles convalescent serum; thus the procedure of inoculation is simple. 4. The danger of infecting a child with syphilis, tuberculosis or other diseases is eliminated. 5. The reactions are less severe and the results are more uniform than those after injecting equally small doses of commercial solutions of placental globulin. 6. The solutions of adult serum can be transported and can be stored in the ice box without loss of potency for at least one year.

American Journal of Pathology, Boston

14: 125-252 (March) 1938

Nesidioblastoma, the Islet Tumor of the Pancreas. G. F. Laidlaw, New York.—p. 125.
Developmental Defects at the Foramen Ovale. B. M. Patten, Ann Arbor, Mich.—p. 135.
Effect of Syphilis on Local Tuberculous Lesions in Rabbits. J. D. Aronson and D. R. Meranze, Philadelphia.—p. 163.
Spontaneous Cardiovascular Disease in the Rat: I. Lesions of the Heart. S. L. Wilens and E. E. Sproul, New York.—p. 177.
Id.: II. Lesions of Vascular System. S. L. Wilens and E. E. Sproul, New York.—p. 201.
Transmission of Chloroleukemia of Mice. J. W. Hall and F. J. Knocke, New York.—p. 217.
Distribution of Material Following Intracerebral Inoculation into Macacus Rhesus Monkeys and Its Possible Influence on Results of Neutralization Tests in Experimental Poliomyelitis. M. Schaeffer and R. S. Muckenfuss, New York.—p. 227.
Modification of Masson Trichrome Technic for Routine Laboratory Purposes. J. Goldner, New York.—p. 237.
Useful Methods for Routine Examination of Brain Tumors. N. C. Foot, New York.—p. 245.

American Journal of Physiology, Baltimore

122: 1-274 (April) 1938. Partial Index

Transmission of Trains of Impulses Through a Sympathetic Ganglion and in Its Postganglionic Nerves. D. W. Bronk, S. S. Tower, D. Y. Solandt and M. G. Larrabee, Philadelphia.—p. 1.
Effect of Administration of Adrenal Cortical Hormone Preparations on Fertility, Pregnancy and Lactation in the Normal Rat. V. E. Hall, San Francisco; P. E. Chamberlin and O. H. Müller.—p. 16.
*Question of Cardiac Hypertrophy During Pregnancy. E. J. Van Liere and C. K. Sleeth, Morgantown, W. Va.—p. 34.
Pancreas and Deposition of Fat in the Liver. C. H. Best and Jessie H. Ridout, Toronto.—p. 67.
Absence of Changes in Gastric Activity and of Gastrointestinal Ulceration Following Hypothalamic Lesions in Monkey and Cat. J. Martin and J. G. Schnedorf, Chicago.—p. 81.
Influence of Adrenalectomy on Ketolytic Activity. E. M. MacKay, San Diego, Calif., and R. H. Barnes, La Jolla, Calif.—p. 101.
Effects of Amniotin or Theelin on Metabolism of Liver and Kidney. Dorothy H. Andersen and J. Victor, New York.—p. 113.
Choline as a Stimulant of Gastric Secretion. F. C. MacIntosh and Luise Krueger, Montreal.—p. 119.
Effects of Adrenalectomy on Water Exchange of Cats with Diabetes Insipidus. W. R. Ingram and C. A. Winter, Iowa City.—p. 143.
Efficiency of Mammary Gland in Production of Milk. W. R. Graham Jr., O. B. Houchin, V. E. Peterson and C. W. Turner, Columbia, Mo. —p. 150.
Lactoflavin (Riboflavin) Increases Hemoglobin Production in Anemic Dog. P. György, Cleveland; Frieda S. Robscheit-Robbins and G. H. Whipple, Rochester, N. Y.—p. 154.
Roles of Anterior Pituitary and Thyroid in Stimulation of Tissue Metabolism Following Theelin Administration. J. Victor and Dorothy H. Andersen, New York.—p. 167.
Early Blood Changes During and Hyperventilation Following Residence at Moderate Altitudes. F. L. Apperly, Richmond, Va.—p. 179.
Changes in Blood Flow Through the Brain and Muscles During Arrest of Breathing. L. Irving, Toronto.—p. 207.
Heart Failure Analyzed in Isolated Heart Circuit. L. N. Katz and M. Mendlowitz, Chicago.—p. 262.

Cardiac Hypertrophy During Pregnancy.—On the basis of their investigations on guinea pigs, cats and dogs, Van Liere and Sleeth maintain that pregnancy does not cause cardiac hypertrophy in these animals. Since pregnancy does not produce cardiac hypertrophy in three different types of animals it seems doubtful that it would produce it in human beings. Increased cardiac work does not necessarily produce cardiac hypertrophy.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

22: 269-400 (May) 1938

Qualifications of Venereal Disease Control Officer. T. B. Turner, Baltimore.—p. 269.
*Thermal Death Time of Gonococcus at Fever Temperatures. C. M. Carpenter, Ruth A. Boak and S. L. Warren, Rochester, N. Y.—p. 279.
Bismuth Studies: VI. Bismuth Absorption from Site of Injection in Dogs. T. Sollmann and Katharine Henderson, Cleveland.—p. 286.
Morphologic Variations of Syphilitic Germ. A. Bessemans, Ghent, Belgium.—p. 294.
Functional Variations of Treponema Pallidum. A. Bessemans, Ghent, Belgium.—p. 301.
*Complement Fixation Test for Gonorrhea with Increased Antibody Content. E. Weiss and L. Arnold, Chicago.—p. 310.
Case of Congenital Neurosyphilis, Aged Sixty Years, with Multiple Osteoarthropathies. W. C. Menninger and C. C. Carlson, Topeka, Kan.—p. 327.
Tryparsamide Dermatitis. F. A. Ellis, Baltimore.—p. 336.
Detection of Syphilis in a Urologic Clinic. L. Friedman and M. L. Mazer, Philadelphia.—p. 340.
Fever Due to Iodides. L. Katzenstein, Baltimore.—p. 346.
Sulfanilamide May Revolutionize Laboratory Identification of Gonococci: Microslide Characteristics Have Changed. W. R. Jones, Seattle.—p. 349.
Mapharsen in Wassermann-Fast Syphilis. L. Chargin and W. Leifer, New York.—p. 355.
Is Mercury a Specific for Syphilis? Preliminary Report. D. M. Sidlick and A. Strauss, Philadelphia.—p. 358.
Accidental Intra-Arterial Injection of Bismuth in Oil with Demonstration of Bismuth by X-Ray in Arterioles of the Penis. L. W. Kimberly, Iowa City.—p. 364.
Effects of Placental Extract on Course of Experimental Rabbit Syphilis. J. E. Kemp and C. Shaw, with technical assistance of Elsie Mae Fitzgerald, Chicago.—p. 368.
Depigmentation of Iris in Experimental Rabbit Syphilis. W. E. Coutts and J. M. Herrera, Santiago, Chile, South America.—p. 381.

Thermal Death Time of Gonococcus.—Carpenter and his colleagues determined the thermal death time at 41.5 C. (106.7 F.) on 250 strains of Neisseria gonorrhoeae. The results show a variation of from six to thirty-four hours in the heat resistance of the cultures studied. Only 0.4 per cent of the strains had thermal death times longer than twenty-four hours. The mean was 16.1 hours, with a standard deviation of 4.8 hours. Approximately 75 per cent of the strains died within one standard deviation to either side of the mean. The data show no correlation between the thermal death time of the strain of gonococcus and either the localization of the infection or the virulence of the invading strain, as expressed by severity of symptoms. A definite thermal death time is a characteristic of each strain of gonococcus, as the thermal death time was unchanged even after the organism was established in a new host; i. e., a consort. A patient may harbor simultaneously more than one strain of the gonococcus. Thus, cultures isolated on the same occasion from two different diseased sites have showed thermal death times which have varied in length from two to nine hours. A similar variance has been noted in the thermal death times of cultures taken from the same source at different times during a period when the patient was receiving no treatment. In some instances a fever treatment one or two hours less in duration than the thermal death time of the isolated organism has resulted in cure. In other cases, however, when the treatment has been four hours shorter than the thermal death time, cure has not been brought about.

Complement Fixation Test for Gonorrhea.—Weiss and Arnold recommend the use of larger amounts of the patient's serum in the complement fixation test for gonorrhea. Larger amounts of the patient's serum (from 1 to 2 cc.) fix larger amounts of complement. By using the same amounts of complement and increasing the amounts of the patient's serum, the stability of the fixation increases. This observation applies in a similar way to the hemolysin (amboceptor). The more serum that is used in the test, the more stable is the reaction with regard to the use of larger amounts of amboceptor. Large amounts of serum contain more antibodies, and, if used in complement fixation tests, they actually fix the complement to a higher degree than smaller amounts of serum. The result is a higher percentage of positive reactions in instances in

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which otherwise negative results would be obtained. The statement that complement fixation tests for gonorrhea are not as stable as observed in syphilis appears to be erroneous on the basis of the authors' results. It is generally accepted that fewer antibodies are present in gonorrheal than in syphilitic serums. In these studies different amounts of a patient's serum were used and it was found that not only the percentage but also the stability of the positive reactions increases with the use of larger quantities of serum. With the use of from 1 to 2 cc. of serum, positive reactions remain strongly positive even after an incubation period of twenty-four hours. The probable cause of this difference in the amount of antibodies is that gonorrhea is a more or less localized infection while syphilis represents a generalized infection. With the use of larger amounts of serums the percentage of anticomplementary reactions must increase and they are more easily detected. If the serums are properly taken, preserved and prepared for the test the number of anticomplementary serums will not be noticeably increased, even when used in larger quantities. Large amounts of natural amboceptor present in increased quantities of the patient's serum do not interfere with the results of the fixation test when a sufficient number of units of artificial hemolysin is used in the hemolytic system. That the test is not applicable in the first three weeks of the infection does not decrease its value. Whenever smears show definitely that gonococci are present, this test is not indicated or necessary. The proper application of this test is found in conditions in which the clinical diagnosis is uncertain and smears do not show gonococci; in treated cases in which the positiveness of the reaction gradually decreases, the ultimate negative reaction probably indicates cure if the reaction remains negative, and in instances in which there is a definite history of a gonorrheal infection and when it is important to determine whether some foci are still present in the body. A positive complement fixation test for gonorrhea indicates the presence of gonococcic foci in the body.

Archives of Physical Therapy, Chicago

19: 193-256 (April) 1938

Studies on Biologic Effect of Colored Light. H. Vollmer, New York.—p. 197.
Present Status of Massage. H. J. Behrend, New York.—p. 212.
Electrosurgical Management of Retinal Separation. O. B. Nugent, Chicago.—p. 219.
Correction of Retinal Separation by Diathermy and Catholysis. L. C. Peter, Philadelphia.—p. 223.
Therapeutic Value of Postural Correction. J. T. Nicholson and L. B. Laplace, Philadelphia.—p. 229.
Multiple Needle Outfit for Histamine Test of Peripheral Circulation. D. H. Kling, Los Angeles.—p. 234.
Transurethral Resection. J. A. Hyams, New York.—p. 235.

Endocrinology, Los Angeles

22: 521-630 (May) 1938

Role of Hypophysis in Cranial Osteomyelitis, Petrositis and Sinus Infections. G. Levene, L. F. Johnson, R. M. Lowman and E. G. Wissing, Boston.—p. 521.
*Relation of Iodine Tolerance to Thyroid Function. E. M. Watson, with technical assistance of A. S. Barber, London, Ont., Canada.—p. 528.
Influence of Thyroid Gland and of Ovary on Metabolism of Iodine: Experimental Study in Dog. H. J. Perkin and B. R. Brown, Boston.—p. 538.
Dynamic Tests in Thyrotoxicosis. W. Bartlett Jr., St. Louis.—p. 543.
Metabolic, Cardiovascular and Biochemical Changes Associated with Experimentally Induced Hyperthyroidism in Schizophrenia. L. H. Cohen and J. H. Fierman, Worcester, Mass.—p. 548.
Experimental Induction of Estrus in the Dog. J. H. Leathem, Princeton, N. J.—p. 559.
Inhibition of Gonadotropic Activity by Sex Hormones in Parabiotic Rats. E. Cutuly and Elizabeth C. Cutuly, Cleveland.—p. 568.
Electrical Excitability (Chronaxie) of Rat's Uterus, Throughout Estrus Cycle. F. C. Katzenstein, Chicago.—p. 579.
Potency of Certain Commercial Hormone Preparations. F. E. D'Amour and Marie C. D'Amour, Denver.—p. 583.
Gonadotropic Potency of Hypophysis in a Wild Male Rodent with Annual Rut. L. J. Wells, Columbia, Mo.—p. 588.

Iodine Tolerance and Thyroid Function.—Watson affirms that the iodine tolerance test (originally abstracted in THE JOURNAL July 4, 1936, p. 76) provides evidence of diagnostic importance in cases of doubtful thyroid disease and that a more comprehensive understanding of endocrine disorders may be acquired by studies of the iodine metabolism. Anatomic and functional abnormalities of the thyroid may be considered from the standpoint of probable alterations of the iodine metabolism. The nature of such disturbances can be studied by observing the rate and completeness of disappearance from the blood stream of iodine after its intravenous injection. The results of ninety-one iodine tolerance tests in eighty cases are recorded. The thyroid apparently is the only organ which abstracts and stores iodine from the blood. This property is accelerated in conditions of thyroid hyperplasia associated with thyrotoxicosis, as exemplified by the abnormal rapidity with which the iodine leaves the blood. Injected iodine disappears less rapidly from the circulation in hypothyroidism. There is no definite correlation between the iodine tolerance and the basal metabolism. The anterior pituitary through its influence on the thyroid may affect the basal metabolism and the iodine tolerance test in an inverse manner.

Florida Medical Association Journal, Jacksonville

24: 519-570 (April) 1938

Use of X-Radiation in Conditions Other Than Malignancy. G. Raap, Miami.—p. 531.
Acute Hematogenous Osteomyelitis. F. A. Vogt, Miami.—p. 534.
Diagnostic Value of Neutralizing Function of the Stomach. K. Phillips and A. B. Litterer, Miami.—p. 537.
Fractures of the Spine. M. P. Travers, Miami.—p. 541.

Journal of Bacteriology, Baltimore

35: 343-454 (April) 1938. Partial Index

Use of Chorio-Allantoic Membrane of Developing Chick Embryo as Medium in Study of Virus Myxomatosum. Rachel E. Hoffstadt and K. S. Pilcher, Seattle.—p. 353.
Strict Anaerobes in Slime and Intestines of Haddock (Gadus Aeglefinus). J. M. Shewan, Aberdeen, Scotland.—p. 397.
Effects of Surface Tension and Osmotic Pressure on Gross Morphology of Certain Pathogenic Fungi. J. W. Williams, Cambridge, Mass.—p. 409.
"Tyrosinase Reaction" of Actinomycetes. C. E. Skinner, Minneapolis.—p. 415.
Serologic Identification of Streptococcus Zymogenes with Lancefield Group D. F. R. Smith, C. F. Niven and J. M. Sherman, Ithaca, N. Y.—p. 425.
Experiments on Nutrition of Streptococci. S. H. Hutner, Ithaca, N. Y.—p. 429.
Electrophoretic Migration Velocity of Escherichia Coli After Cultivation on Mediums of Various Composition: II. Observations Following Changes in Inorganic Constituents. R. P. Tittsler and G. P. Berry, Rochester, N. Y.—p. 441.

Journal of Urology, Baltimore

39: 391-588 (April) 1938

Report of Seven Cases of Cystitis Emphysematosa. H. G. Wells, Chicago.—p. 391.
Urethral Ectopic Ureter in the Female Without Incontinence: Case Report. I. Freeman, Baltimore.—p. 398.
*Is Sudden Emptying of Chronically Distended Bladder Dangerous? C. D. Creevy, Minneapolis.—p. 403.
Prostatography: Preliminary Report. S. Soifer, Brooklyn.—p. 410.
Primary Carcinoma of Urethra: Report of Case. P. D. Melvin, Miami, Fla.—p. 414.
Further Report on Use of Livermore Method for Relief of Hydrocele. G. R. Livermore, Memphis, Tenn.—p. 418.
Anatomic Study by Injection Technic of Ejaculatory Ducts and Their Relations. S. McMahon, San Francisco.—p. 422.
Fundamentals in Water Balance. W. G. Maddock, Ann Arbor, Mich.—p. 444.
Electric Meatotome. L. W. Riba, Chicago.—p. 464.
Two-Stage Nephrectomy. C. P. Mathé, San Francisco.—p. 469.
Ectopic Kidney: Report of Thirteen Cases Exclusive of Horseshoe Kidneys. D. W. MacKenzie and A. B. Hawthorne, Montreal.—p. 479.
Squamous Cell Carcinoma of Renal Pelvis, with Special Consideration as to Etiology. A. A. Kutzmann, Los Angeles.—p. 487.
Diverticula and Cyst of the Female Urethra. C. M. Johnson, San Francisco.—p. 506.
New Incision for Radical Operation for Epithelioma of the Penis. F. P. Johnson, Portland, Ore.—p. 517.
Value of Correlating Hormone Tests with Histologic Sections in Tumor of the Testis. T. O. Powell, Los Angeles.—p. 522.
*Urogenital Tuberculosis: Complications Following Diagnostic and Surgical Procedures. R. B. Henline and J. L. Bray, New York.—p. 529.
Urology in Children. H. O. Mertz and H. G. Hamer, Indianapolis.—p. 548.
Clinical Evaluation of Cystometer. J. G. Cheetham, Portland, Ore.—p. 569.

Sudden Emptying of Distended Bladder.—Creevy reviewed the postmortem records of seventy-one patients with enlarged prostates who died without being operated on, in order to determine whether sudden emptying of a distended bladder was dangerous. Detailed study of this material led to the following conclusions: 1. The rate at which the distended bladder is emptied does not influence the outcome. 2. It is

impossible to distinguish by examination of the urinary tract at necropsy between bladders emptied suddenly and bladders decompressed slowly. 3. Death was due in 80 per cent of the patients who died after catheterization to renal failure secondary to acute and chronic pyelonephritis superimposed on a varying degree of hydronephrosis. 4. In 20 per cent death was due to extrarenal disease, such as pneumonia, endocarditis, pyemia and peritonitis. In this group are found the counterparts of those sudden deaths recorded in the literature as due to reflex syncope or to shock; these patients, however, died of pulmonary embolism and coronary thrombosis. 5. All the phenomena usually attributed to sudden emptying of the distended bladder may be produced by acute pyelonephritis. The author checked these conclusions against clinical as well as necropsy material. He reviewed two series of patients, all with 500 cc. or more of residual urine due to obstruction at the vesical neck. These two series each consisted of approximately 120 patients. The first group, seen in 1918 and 1919, had been treated with the inlying catheter without regard to the rate of the emptying of the bladder, while the second had been subjected to gradual decompression. Of the first group, 4.1 per cent died without other treatment. The survivors were treated by suprapubic prostatectomy with a mortality of 5.2 per cent. In the second group the mortality was 4.16 per cent and from prostatectomy 5.3 per cent. This supports the conclusion that gradual decompression of the chronically distended bladder offers no advantage over simple catheterization.

Urogenital Tuberculosis.—Henline and Bray stress that urogenital tuberculosis is a localized lesion which is only part of the general disease from which the patient is suffering. Tuberculosis is almost invariably present elsewhere in the body, and recognition of the extent and stage of the disease is essential before local treatment is instituted. The frequency with which tuberculous meningitis and miliary and pulmonary tuberculosis develop as terminal stages in patients with urogenital tuberculosis has not been stressed in the literature. These manifestations may occur during or immediately after diagnostic or surgical procedures, or months or even years later. When they occur in the course of diagnostic or surgical urogenital treatment, it is natural to assume a relationship between the manipulation and the fatal tuberculous lesion. There is no more reason for anticipating a dissemination of the infection after surgery for tuberculosis than after surgical procedures in other pyogenic infections. Seven histories are presented of patients who have died from the progression of a generalized tuberculous process after diagnostic or surgical urogenital procedures.

New England Journal of Medicine, Boston

218: 627-662 (April 14) 1938

Heterotopic Gastric Mucosa. A. R. Kimpton and A. R. Crane, Boston.—p. 627.
The Hinton Test: V. Adult Congenital Syphilis Otherwise Undetected. A. W. Cheever, Boston.—p. 630.
Id.: VI. Syphilis Acquired in Childhood. A. W. Cheever, Boston.—p. 632.
Primary Adamantinoma of the Tibia. R. E. Dunne, Hartford, Conn.—p. 634.
Practical Physical Medicine for Chronic Arthritis. R. T. Phillips, Boston.—p. 639.

Northwest Medicine, Seattle

37: 95-126 (April) 1938

Imperforate Anus: Report of Case. H. E. Coe, Seattle.—p. 95.
Diverticulitis. E. A. Nixon, Seattle.—p. 97.
Spontaneous Ileocolostomy. O. F. Lamson, Seattle.—p. 100.
Perforation of Aorta and Jejunum by Metastatic Carcinoma Resulting in Exsanguination. R. E. Mosiman, Seattle.—p. 101.
Bumper Fractures of Tibia. H. T. Buckner, Seattle.—p. 102.
Osteochondritis Dissecans: Report of Cases. H. J. Wyckoff, Seattle.—p. 105.
Multiple Fractures in the Aged. P. W. Willis, Seattle.—p. 106.
Shelving Operations of the Hip. J. F. LeCocq, Seattle.—p. 107.
Radical Inferior Cheiloplasty for Advanced Carcinoma of Lower Lip: Report of Two Cases. J. E. Wirth, Seattle.—p. 109.
Pregnancy Tests: A Few Timely Remarks. P. R. Rollins, Seattle.—p. 112.
Placenta Praevia and Its Frequency in Private Practice. C. M. Helwig, Seattle.—p. 114.
Carcinoma of Right Lung: Probably Primary. J. N. Davis, Kimberly, Idaho.—p. 115.

Ohio State Medical Journal, Columbus

34: 369-496 (April) 1938

Modern Pulmonary Tuberculosis Therapy. P. M. Holmes, Toledo.—p. 385.
Gastroscopy as Diagnostic Aid. E. A. Marshall, Cleveland.—p. 388.
Congenital Absence of Vermiform Appendix: Case Reports. C. M. Rambo and L. Lasky, Zanesville.—p. 394.
Intracranial Arteriovenous Aneurysm. G. D. Kirk, Columbus.—p. 395.
Osteochondroma of the Bronchus: Case. P. W. Gebauer, Cleveland.—p. 398.
Streptococcic Septicemia. H. A. Bollinger and L. R. Effler, Toledo.—p. 399.
Transurethral Prostatectomy. W. A. Keitzer, Akron.—p. 400.
Prevention of Infection and Relapse in Fungous Disease of the Feet. L. Goldman, Cincinnati.—p. 405.
Shock Therapy of Schizophrenia. Beatrice Postle, Columbus.—p. 410.
Melanosarcoma of Choroid: Case Reports. H. V. Phelan, Cleveland.—p. 414.

Pennsylvania Medical Journal, Harrisburg

41: 565-662 (April) 1938

Use of Relaxation Incisions When Dealing with Scars. J. S. Davis, Baltimore.—p. 565.
Early Diagnosis of Perinephric Infections. W. A. Barrett, Pittsburgh.—p. 573.
Chronic Infection of Pharynx. H. P. Schenck, Philadelphia.—p. 578.
Significance of Dermatophytosis in Diabetes. H. T. Kelly, Philadelphia.—p. 581.
Syphilitic Diabetes: Additional Case Reports. J. R. Kitchell, Philadelphia.—p. 587.
End Results in Uncontrolled Mild Diabetes. E. S. Dillon and W. W. Dyer, Philadelphia.—p. 589.
Syphilis and Optic Atrophy: Plea for Early Diagnosis. P. L. Davis, Philadelphia.—p. 591.
Evaluation of Procedures Used in Diagnosis of Pulmonary Disease. C. H. Marcy, Pittsburgh.—p. 594.
Surgical Treatment of Brain Abscess. F. C. Grant and R. A. Groff, Philadelphia.—p. 597.
Ciliary Spasm. C. Carpenter, Philadelphia.—p. 601.
Functional Results of Gallbladder Surgery in 500 Cases. P. Correll, Easton.—p. 604.
The Executive Assistant to the Trustee: A Liaison Officer. R. L. Anderson, Pittsburgh.—p. 607.
How to Educate Rural Communities in Adequate Maternal Care. J. S. Taylor, Altoona.—p. 610.
The Problem of the Early Diagnosis of Cancer. W. L. Estes Jr., Bethlehem.—p. 613.

Philippine Islands Med. Association Journal, Manila

18: 125-188 (March) 1938

Intergovernmental Conference of Far Eastern Countries on Rural Hygiene, with Particular Reference to Leprosy. C. Manalang, Manila.—p. 125.
Non-Acid-Fast Forms of Mycobacterium Leprae in Leprotic Lesions: Preliminary Report. J. Manalang, Culion.—p. 135.
*Can Malaria Be Contracted in Utero? E. Y. Garcia, Manila.—p. 141.
Keratomalacia in Children. A. V. Tupas and L. Pecache, Manila.—p. 147.
Presence of Rickettsia in Brains of Rats Captured in Manila. K. Oda, Manila.—p. 151.

Malaria in Utero.—Garcia cites two cases of malignant tertian malaria infection occurring during pregnancy and terminating fatally before the onset of labor. In the first case, ring forms, old trophozoites and schizonts of Plasmodium falciparum were found in the maternal blood immediately before death and infected cells were found in large numbers in histologic sections of the placenta and a few in the umbilical cord. In the second case a large number of infected cells (young and old schizonts of Plasmodium falciparum) were found in the heart and bone marrow of the fetus and a few in the cord. These cases present more definite proof of the existence of transplacental infection in the fetus, he says, than has previously been recorded in the literature.

Physiological Reviews, Baltimore

18: 137-328 (April) 1938

Sympathetic Vasodilator Fibers. J. H. Burn, London, England.—p. 137.
Sites of Formation of Estrogenic Substances in Animal Body. G. W. Corner, Rochester, N. Y.—p. 154.
Autolysis and Atrophy. H. C. Bradley, Madison, Wis.—p. 173.
Causes and Mechanism of Thrombosis. M. Silberberg, St. Louis.—p. 197.
Arteriovenous Anastomoses. E. R. Clark, Philadelphia.—p. 229.
Undernutrition and Carbohydrate Metabolism. W. H. Chambers, New York.—p. 248.
Present Status of the Ergot Question. E. E. Nelson, New Orleans, and H. O. Calvery.—p. 297.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 661-712 (March 26) 1938

Physical Basis of "Biliousness" and "Wind Round the Heart." A. Hurst.—p. 661.
*Output of Prolan A in Urine in Certain Extragenital Conditions: Report of an Investigation. Dorothy Woodman.—p. 666.
Labyrinthine Giddiness: Its Nature and Treatment. A. J. Wright.—p. 668.
Internal Strangulation Through an Aperture in the Mesentery. J. A. Baty.—p. 671.
Incidence of Unequal Pupils in Unconvicted Prisoners. H. K. Snell and G. A. Cormack.—p. 672.

Follicle Stimulating Factor in Extragenital Conditions.—Woodman examined sixty-six cases in which there were lesions of the secondary sex organs for their urinary excretion of the follicle stimulating factor. The method used to determine the amount of the factor in the urine was that described by Ferguson (1933). Of the twenty-eight cases of varying breast lesions investigated, two gave positive results—acute abscess (it was later found that the patient was pregnant) and tuberculous mastitis. The positive reaction in the case of tuberculous mastitis cannot be explained unless the patient was pregnant at the time and the pregnancy had a short duration and was terminated without the patient being aware of the fact. All the thirty-two cases of benign enlargement of the prostate, both before and after operation, gave negative results, indicating that the hypertrophy of the prostate which develops in later life cannot be correlated with that form of pituitary activity which is associated with an increased excretion of gonadotropic substance and also that the Aschheim-Zondek test has no diagnostic value in this condition. The only case of pituitary adenoma (associated with acromegaly) gave a negative result. Two cases of teratoma testis were both positive. Another positive reaction was in a woman of 25 who complained of a blood-stained discharge following a miscarriage. Two months after the miscarriage a positive Aschheim-Zondek reaction was obtained. As the discharge continued, curettement was done. Only blood clot and fragments of normal-looking endometrium were found. Three weeks later the Aschheim-Zondek test was negative. Eleven months after the curettement, the patient returned to the hospital with a large mass in the uterus which was diagnosed as a chorionic epithelioma, and a positive Aschheim-Zondek reaction was obtained. She was treated with radium, and a week later the test was repeated and was still strongly positive. She died a day after the last test. A large mass was found in the uterus and vagina, with metastatic nodules in the lungs. In the beginning a normal pregnancy was present. The pregnancy was later terminated in an abortion, which explains the curettage observations and the negative test, but some residual chorionic tissue must have been present, since a chorionic epithelioma developed later; but at that stage it was not sufficient to give a positive Aschheim-Zondek reaction.

Glasgow Medical Journal

11: 161-220 (April) 1938

Paget's Disease of Bone: Its Frequency, Diagnosis and Complications. J. F. Brailsford.—p. 161.

Lancet, London

1: 707-762 (March 26) 1938

Chronic Mastitis. H. J. B. Atkins.—p. 707.
*Intrathecal Sulfanilamide in Meningococcic Meningitis. A. Eldahl.—p. 712.
Pseudohemophilia in a Woman. H. Joules and R. G. Macfarlane.—p. 715.
*Serologic Studies in Epidemic Influenza, with Particular Reference to Persistence of Antibodies After Infection. R. W. Fairbrother and A. E. Martin.—p. 718.
*Vitamin K in Human Pathology. H. Dam and J. Glavind.—p. 720.

Intrathecal Sulfanilamide in Meningococcic Meningitis.—Eldahl treated twelve patients who had severe meningococcic meningitis with sulfanilamide intrathecally. Their ages varied from 3 months to 4 years. Three patients died. Two patients among those who recovered had meningococcic septicemia. Both children were at the time of their admission so run down that the outlook was hopeless. Nevertheless they got well quickly. The conclusion reached about the sulfanilamide treatment of meningococcic meningitis is that it has but little effect if the remedy is administered exclusively by mouth or intramuscularly. But if it is given intrathecally along with the other administrations, the treatment is of real value. This is probably because the elimination of the sulfanilamide through the meninges may be both slow and slight when they are inflamed. It is not likely that intrathecal injections alone are sufficient, because meningococci can be found outside the spinal canal, and on these the sulfanilamide, when given by mouth or intramuscularly, can have considerable effect. The amount of the 0.8 per cent sulfanilamide solution injected varies from 5 to 30 cc., according to the amount of spinal fluid withdrawn but is always less than the amount withdrawn. The intramuscular doses have been from 35 to 150 cc., according to the weight of the patients. The average fatality rate of meningococcic meningitis in the author's hospital for the last six years has been 70 per cent for children less than 4 years of age.

Serologic Studies in Epidemic Influenza.—The reason for the relatively short duration of immunity to influenza has not been determined. In view of the high antibody content usually found in those who have recently recovered from infection, this low-grade immunity is surprising. The probable factors are the existence of several immunologically distinct strains of virus and the rapid disappearance of the antibodies produced by infection. As a number of recently infected persons were available, Fairbrother and Martin studied the fluctuations in the antibody content of their serum over periods of from ten to twelve months; i. e., the part played by the second of the foregoing factors. The antibody titer appears to be a simple index of resistance to infection—absence of antibodies or a relatively low titer indicates susceptibility and a high titer resistance. The critical level that demarcates these two states cannot however be defined with any accuracy. The high level in the antibody content of the serum is not maintained and after from ten to twelve months the titers tend to fall to a level similar to that given before infection.

Vitamin K in Human Pathology.—According to Dam and Glavind, thrombopenia, aplastic anemia, hemophilia, nontropical sprue, myeloma, acute hepatitis, obstructive jaundice, cholelithiasis and cancer may be expected to influence the clotting time. A reduced platelet count has no influence on the clotting time. That injection of a vitamin K concentrate may restore the clotting power of the blood of K avitaminous chicks is known. Therefore the authors gave intramuscular injections of K vitamin concentrates to three patients (one of cancer and two of obstructive jaundice due to cancer) with increased clotting values. The parenteral introduction of 15 mg. of vitamin K daily rendered the clotting power normal in from six to eight days and therefore it is concluded that the increased clotting time before the introduction was due to reduced absorption of vitamin K from the intestine. Experiments on rats having bile fistulas were carried out by Greaves and Schmidt in 1937, who found that an excess of vitamin K in the food counteracted the hemorrhagic diathesis. Warner, Brinkhous and Smith report that the action of alfalfa extract mixed with bile and given by mouth was superior to the usual bile therapy.

Medical Journal of Australia, Sydney

1: 509-550 (March 19) 1938

Physiologic and Biochemical Considerations of Hepatic Function in Health and Disease. I. Maxwell.—p. 511.
Tuberculous Arthritis of the Hip Joint. T. P. McMurray.—p. 515.
Treatment of the Tuberculous Hip in Children. L. O. Betts.—p. 518.
Treatment of the Tuberculous Hip. J. G. Whitaker.—p. 521.
Matti's Spongiosa Bone Transplant for Ununited Fractures. T. King.—p. 526.
Surgery in the Aged and Debilitated. J. Kennedy.—p. 531.

1: 551-596 (March 26) 1938

Control of Maternal Mortality and Morbidity. R. M. Allan.—p. 551.
Social Aspects of Rheumatism: Note. F. J. Poynton.—p. 555.
Interpretation of MacLean's Urea Concentration Test in Assessing Renal Function in Pregnancy. Vera I. Krieger.—p. 557.
Some Further Results of Short Wave Therapy. K. R. Speeding.—p. 565.
Dislocation of Intervertebral Disks. R. A. Money.—p. 571.
Observations on Heights and Weights and Growth of Preschool Children in the City of Melbourne. Hilda E. Kincaid and Margaret Stuckey.—p. 575.

Presse Médicale, Paris

46: 649-696 (April 27) 1938. Partial Index

*Electro-Encephalogram in Certain Pathologic Conditions. G. Marinesco, O. Sager and A. Kreindler.—p. 650.
Total Extirpation of Pancreatic Cysts. I. Iacobovici.—p. 655.
Drainage of Hypophysis Toward Hypothalamus. G. T. Popa.—p. 663.
Pulmonary Cancer in Miners of Joachimstal. H. Sikl.—p. 673.
So-Called Hemolytic Icterus. M. Netousek.—p. 675.
*Lead Content of Blood After Mobilization: Value of This Method in Diagnosis of Saturnism. J. Teisinger.—p. 676.
Several New Experimental Observations on Role of Spleen. A. Kostitch.—p. 683.
Posterior Radicotomy in Treatment of Spasmodic Paralysis. M. Yovtchitch.—p. 689.

Electro-Encephalogram.—Marinesco and his associates point out that it was Berger who first attempted to visualize the variations in the electric potential derived from the cranium. As electrodes he employed needles, which he attached to the scalp after local anesthesia and he made the registration by means of an oscillograph. On the graphic record obtained in this manner he differentiates waves of a frequency of from 8 to 10 Hertz and of a maximum potential of 0.2 millivolt, designated by him as alpha waves; and waves of a greater frequency but a smaller amplitude, which are superimposed on the first and are designated as beta waves. The alpha waves are dependent neither on the respiration nor on the pulsation and consequently they must be an electrical rhythm of the cerebral cortex. Berger's observations were confirmed, completed and extended by a number of other investigators. Marinesco and his associates studied this problem for the last two years. They made their electro-encephalograms either with the method of Berger, by attaching the needles to the anesthetized scalp, or by applying the impolarizable electrodes to the shaved scalp. In the construction of the impolarizable electrodes the authors followed the method used by Lapicque for the electrical excitation of the nerves. Like other investigators, the authors encountered difficulties in interpreting the results. As the most constant characteristic of an electro-encephalogram they regard the frequency of the alpha waves; in the same subject these waves maintain the same level during the entire duration of the recording. The authors regard as anomalies considerable diminutions and augmentations of the frequency, which occur transiently in the course of the recording. On the other hand, the amplitude of the waves varies considerably in the course of a recording. In certain pathologic conditions, several modifications may become manifest. In this paper the authors report their observations on the electro-encephalograms of patients with such disorders as tetany, epilepsy, aphasia, cerebral tumor and coma. They found that in some pathologic cases the anomalies of the electro-encephalogram consisted especially in modifications of the amplitude (epilepsy, tetany) or of the amplitude and of the frequency (aphasia, cerebral tumors and so on). The pathologic cases, with modifications of the frequency but without changes in the amplitude, are extremely rare. Generally a diminution in the frequency is accompanied by a diminution of the amplitude, as for instance in aphasia and in certain cerebral tumors and even with an augmentation of amplitude, as in a case of coma. Nevertheless there are exceptions. In some of the reported cases of aphasia the frequency alone was diminished. But this reduction in frequency was accompanied, if not by a modification of the amplitude, by the intercalation of long pauses. In two cases of cerebral tumor the authors encountered an augmentation of the frequency (15 Hertz in the one, to 18 Hertz in the other) without modification of the amplitude. Likewise, in dementia paralytica the authors occasionally encountered a diminution of the frequency without modification of the amplitude. But this occurrence is rare; in the ninety pathologic cases examined, the authors observed it only eight times.

Mobilization of Lead in Saturnism.—Teisinger shows that the determination of the lead content of the blood is the best diagnostic method in chronic lead poisoning. It is better than the determination of the lead in the urine and in the stool. The most convenient method is the micropolarographic one, because it requires only a small quantity of material and it is at the same time rapid and exact. In advanced cases of lead intoxication, with all or some of the objective symptoms, the lead content of the blood is always increased. If the intoxication is recent, the high lead content of the blood confirms the diagnosis of intoxication even if the objective symptoms are missing. In extremely chronic cases the lead content of the blood may be normal, even in case of positive intoxication. In these cases diagnostic mobilization may be considered a primary sign. The best means to effect this mobilization are potassium iodide or sodium bicarbonate. The author employed mobilization by means of potassium iodide in eleven cases. The patients were given 10 Gm. of potassium iodide in the course of a week. In five of the cases the result was positive and in the six others the result was negative. Since none of these patients had presented the objective signs of saturnism, it would have been difficult to diagnose the lead poisoning otherwise. Sodium bicarbonate, which increases the elimination of lead in the urine and feces, was used by the author in eight cases. The patients were given 50 Gm. of sodium bicarbonate in the course of a week. In four of them the result was positive; in the other four it was negative. In three of the positive cases, objective symptoms of saturnism existed. Discussing the mobilization by means of parathyroid extract, the author says that this method was first employed by Hunter and Aub. In view of the fact that the metabolism of lead is closely allied with that of calcium, it is assumed that parathyroid extract will influence it. The author decided to try mobilization by parathyroid extract in one case in which saturnism seemed possible and in two cases in which it was certain. In none of the cases did the administration of parathyroid extract result in an elimination of lead or an elevation of the lead content of the blood. However, animal experiments on the mobilization of lead by parathyroid extract proved successful. The author thinks that great differences exist in the potency of parathyroid extract and emphasizes that only those preparations should be used the potency of which is controlled.

Archiv für Verdauungs-Krankheiten, Basel

62: 305-364 (March) 1938

Protein and Mucin in Normal and Pathologic Gastric Juice. F. Baltzer.—p. 305.
*Functional Test of Stomach with Aid of Uranin Elimination. W. Rotter.—p. 337.

Uranin Elimination as Functional Test of Stomach.—Rotter cites several functional tests of the stomach but directs attention especially to the dyestuff method of Goldstein and Erber, because it was to be expected that this method would be an aid in the differential diagnosis of ulcer and gastritis. Goldstein and Erber studied the resorption of the dyestuff uranin through the gastric mucosa and discovered that the resorption is more rapid in patients with ventricular and duodenal ulcer than in patients with normal stomachs or with gastritis. Rotter decided to investigate the reliability of the method as a differentiating factor between gastritis and ulcer. On the whole he followed the technic used by Goldstein and Erber. The patients, who had emptied the bladder at 5 a. m., drank at 8 or 9 a. m. 1 Gm. of uranin dissolved in 250 cc. of slightly sweetened tea. Beginning with the fifth minute after this the urine was evacuated at one minute intervals and the first appearance of a noticeable fluorescence was watched for. In order to avoid errors due to the color of the urine and to the difference in quantity of urine contained in the bladder, Rotter catheterized the patients before the test and introduced into the bladder 250 cc. of a sterile, tepid physiologic solution of sodium chloride. In comparing his results with those of Goldstein and Erber he says that, whereas Goldstein and Erber observed an accelerated elimination of uranin in patients with gastric or duodenal ulcer, he observed a retardation. He found that the time after which the physiologic solution of sodium chloride that is introduced into the bladder shows noticeable fluorescence is influenced by many factors that may cause a disturbance. He thinks that the most important of these factors are the anatomic impairment of the gastric mucosa by a chronic inflammation and the readily influenced secretory function of the kidney, whereas the acidity values of the mediums that dissolve the uranin apparently exert no essential influence on the outcome of the test. Moreover, the fact that the mucosa

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of the small intestine absorbs the dyestuff in the same measure as does the gastric mucosa shows that the method is not really a test of the gastric function. The author concludes that the uranin test cannot be recommended as an auxiliary functional test of the stomach.

Policlinico, Rome

45: 165-216 (April 1) 1938. Medical Section

Cushing Syndrome from Trauma. F. Introna.—p. 165.
Extrarenal Azotemia in Diseases of Nervous System. D. De Paolis.—p. 182.
*Meningeal Reactions from Serum. F. Rocchi.—p. 187.

Meningeal Reactions from Serum Therapy.—Rocchi discusses the significance of the meningeal reactions which follow intraspinal injections of heterologous serum and the danger of the reactions which take place in the course of serotherapy in epidemic cerebrospinal meningitis. He followed the behavior of the meningeal reactions which took place in the course of intraspinal injections of heterologous serum in patients who were suffering from poliomyelitis, tetanus and meningococcic meningitis. The meningeal reaction takes place whether or not the meninges are inflamed. The reaction develops within twenty-four hours of the injection, reaches its greatest intensity in two days and diminishes or disappears in a week. Even though further intraspinal injections of serum are administered, the reaction disappears. The meningeal reaction may include the appearance of clinical meningeal symptoms in association with changes of the cytology of the cerebrospinal fluid or only the latter. The cytologic reaction consists in a predominant polynucleosis in the cerebrospinal fluid with a few histiocytes. The clinical symptoms and the colloidal reactions of the cerebrospinal fluid are of a meningitic type. Glycorrhachia is normal. General symptoms of serum anaphylaxis may develop in the course of the reaction, but in all his experience the author has never seen meningeal anaphylaxis. He classifies the meningeal reactions from intraspinal serum therapy as immediate (clinical and cytologic) and late (general or focal anaphylactic) reactions. He suggests the name "meningosis" for the meningeal serum reactions. The nature of this reaction, either toxic or anaphylactic or showing an aggravation of meningococcic or suppurative meningitis, can be ascertained by the cytology of the cerebrospinal fluid. The polymorphonuclear leukocytes, which are in abundance in the cerebrospinal fluid during the meningeal reaction, are well preserved and take a stain normally when there is no meningitis. Pus shows in the cerebrospinal fluid by the Cesaris-Demel reaction when there is meningitis. The author concludes that toxic or anaphylactic reactions from serum do not develop as frequently as believed and that the fear for the development of the reaction is not an obstacle in administering a prolonged serum treatment in epidemic cerebrospinal meningitis.

45: 153-200 (April 15) 1938. Surgical Section

Late Results of Surgical Interventions in Gastroduodenal Ulcer. A. Casini.—p. 153.
*Action of Antivirus in Experimental Pleurisy. P. Stefanini.—p. 173.
Familial Osteogenic Exostoses, Associated in a Case with Bilateral Dyschondroplasia and Solitary Enchondroma of Pelvis. M. Teramo.—p. 185.

Antivirus in Experimental Pleurisy.—Stefanini says that antiviruses are nontoxic substances which inhibit the development of specific bacteria "in vitro" and cause local immunity when they come in contact with organs and tissues of living bodies. The author studied the action of a staphylococcus antivirus on experimental staphylococcic pleurisy in rabbits. He found that the intrapleural injection of a dose which may vary from 1.5 to 3 cc. of a twenty-four hour bouillon culture of Staphylococcus aureus induces an acute purulent pleurisy with death of the animals in three days. Intrapleural injection of doses varying from 4 to 6 cc. of the antivirus, twenty-four hours before injection of from 2 to 3 cc. of the bouillon culture of staphylococcus, prevents development of pleurisy. The animals survive the experiment and when they are killed do not show pleuropulmonary lesions. If the antivirus is intrapleurally injected at the same time as bouillon culture, pleurisy may be prevented, provided the quantity of antivirus is larger than that of the culture (one part of bouillon culture to six parts of antivirus). If antivirus is injected in the course of pleurisy, the evolution and acuteness of the disease are not modified. The duration of life of the animals in this group is not prolonged in comparison to that of the control animals. The author concludes that staphylococcus antivirus causes local immunity in the pleura. The antivirus has an immunizing effect on the pleura and not a therapeutic effect on pleurisy. Therefore it has no clinical application in pleurisy. However, it can be of use in preventing metapneumonic and parapneumonic empyema in the course of pneumonia or bronchopneumonia. He advises the preparation of "stock" antivirus from bacteria that most frequently cause pneumonia and bronchopneumonia. The use of a given antivirus will be decided from the report of the bacteriologic examination of the sputum in each case. Intrapleural injections of "stock" antivirus will also be indicated immediately after lobectomy and pneumonectomy to prevent postoperative pleural infections. Doses of antivirus for the last mentioned purposes are not as yet determined.

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21: 193-254 (April 15) 1938

Unknown Points of Neurohumoral Doctrine: Inversion of Effects of "Chemical Mediators." U. Lombroso.—p. 193.
Early Results of Treatment by Blood Serum of Testicular Vein of Oxen in Psychosis. R. Melgar and J. L. Peluffo.—p. 202.
*Bulgarian Treatment in Postencephalitic Parkinsonism. A. Gandellini.—p. 218.
Biochemical Mechanism of Shock from Insulin and Metrazol. J. Cuatrecasas and A. A. Bruno.—p. 224.

Bulgarian Treatment in Postencephalitic Parkinsonism.—The Bulgarian therapy of parkinsonism consists essentially in the daily administration of a 5 per cent decoction of atropa belladonna in white wine, administered three times a day in doses of 5 cc. to patients under 15 years of age and of 15 cc. to patients over 15. The treatment includes also the administration of a bland diet, suppression of stimulants, hygienic practices, gymnastics, reeducation of patients and sometimes orthopedic corrections. Gandellini treated 150 cases, in 120 of which improvement occurred to a greater or lesser degree.

Archiv für klinische Chirurgie, Berlin

191: 237-546 (March 8) 1938. Partial Index

*Lipophage Disease of Knee Joint (Lipophage Synovitis and Lipophage Granuloma) New Disease of Knee Joint and of Joints in General. M. Biebl.—p. 237.
Treatment of Fractures and Pseudarthrosis. E. Birt.—p. 327.
Pathogenesis and Nature of Perthes's Disease. S. Nagura and S. Kosuge.—p. 347.
Lymph Node Metastases of Cutaneous Cancer of Nose and Forehead. J. Körbler.—p. 421.
Relations Between Adenoma and Carcinoma of Prostate. B. Bibus.—p. 427.
*Production of Venous Stasis and Its Action on Pulmonary Lobes, as New Surgical Treatment of Pulmonary Tuberculosis. R. Valkányi.—p. 504.

Lipophage Disease of Knee Joint.—Biebl says that, although the lipophagic granuloma in its nonarticular localizations has been thoroughly investigated, the lipophagic disease of the knee joint is unknown in the medical literature. He describes two cases of lipophage disease of the knee joint. In both the disorder was posttraumatic and gave the impression of a relapsing effusion into the joint. The author surveys the literature on the clinical aspects, pathology, etiology, morphology, morphogenesis and localization of the lipophagic disease process, including the paraffinoma, oleogranuloma and transplantation of fat tissues. In lipophagic disease of the knee joint, which includes lipophagic synovitis and lipophagic articular granuloma, the author was able to demonstrate that the small cyst or cavity formations which are typical for lipophagic granuloma are at least partly of lymphogenic origin. The author suggests that lipophagic disease of the joints is probably always posttraumatic and derived from a lipohemarthrosis. It may involve any joint but is found chiefly in the knee joint. The author thinks that active puncture treatment of hemarthrosis is important for the prevention of lipophagic disease of the joints. The clinical manifestation of lipophagic disease of the knee joint is chiefly a chronic relapsing effusion after a trauma. In every posttraumatic relapsing effusion into the knee joint, the development of a secondary lipophagic disease should be thought of. The disorder may heal spontaneously and with the aid of symptomatic treatment. If under the influence of conservative treatment there is no improvement, danger of a chronic impairment of the

knee exists. In some of the disorders of the knee joint which are referred to as chronic villous synovitis or as hemorrhagic synovitis and which often date back to a trauma of the knee, an originally lipophagic genesis is to be suspected. Moreover, circumscribed or multiple intra-articular xanthomas or xanthogranulomas or xanthomatous giant cell tumors or sarcomas of the knee and ankle joints, which likewise can frequently be traced back to a trauma of the knee, may originally have been of lipophagic genesis. In case of chronic relapse of an effusion of the knee joint, which two or three months after the trauma has disappeared neither spontaneously nor in response to conservative treatment, surgical intervention is indicated. Operative treatment of lipophagic articular disease may produce a complete cure. During the early stages of the disease the intervention should be limited to the partial excision of the intra-articular disease foci. The hyperemia induced by the surgical intervention favors the complete cure. The cases of lipophagic disease of the knee joint which have become chronic require radical synovectomy.

Venous Stasis as Surgical Treatment of Pulmonary Tuberculosis.—After citing the shortcomings of Bier's and Kerschner's methods of the artificial production of stasis hyperemia in the treatment of pulmonary tuberculosis, Valkányi describes his own extrapleural, transpericardial, that is, extrafocal, selective procedure, which is really not a pulmonary operation but rather a cardiac intervention, aiming at cure of the lung. In this connection the author points out that thoracoplasty, for instance, is likewise not a pulmonary operation but rather an intervention on the thoracic wall. He gives a detailed description of the technic of his lobovenoligature with illustrative diagrams. Describing the intervention on the left side, he says that he makes a transverse, slightly curved incision in the second intercostal space, which reaches from the left sternal rim to the anterior axillary line. The sternal attachment of the thoracic musculature is pushed aside, and after the second and third costal cartilages come into view they are resected together with from 5 to 7 cm. of the respective ribs. The mammary artery and veins are ligated twice and sections (from 1 to 2 cm.) are resected. The posterior articular ligament of the two sternochondral joints is cut into and the sternal attachment of the intercostal musculature is severed and pushed aside. The endothoracic fascia and the transverse thoracic muscles are lifted from the pleura and incised. After the pleura has been mobilized it is pushed aside and a narrow strip of the mediastinal fat tissues and the pleura of the other side come into view. Farther downward, the mediastinal fat tissue becomes wider and passes into the pulsating pericardium. The latter is opened at the lower angle of the incision, at the level of the fourth costal cartilage, behind the sternum. The opening is lengthened to the level of the second costal cartilage. At the level of the upper rim of the third costal cartilage an incision is made which is vertical to the pericardial incision. An anesthetizing fluid is injected into the exposed phrenic nerve. The left lip of the pericardial opening is drawn to the left and the heart is pushed carefully to the right. In the upper angle of the opening, the bulb of the pulmonary artery as well as its left branch become visible, and deeper down and in the caudal direction the left upper pulmonary vein is reached, which is ligated. After mentioning the closing sutures, the author describes the procedure on the right side, which is slightly more difficult. He emphasizes that the rather difficult surgical technic necessitates considerable practice on cadavers. He performed this operation on five patients, one of whom died. In another patient, the operation produced no improvement in the pulmonary process. In this case the process had existed for a long time and the pulmonary lobe had a number of cicatrized cavities. The author thinks that in such cases the venous ligature is not advisable. In one case, with a cavity in the upper lobe, ligation of the vein produced cure in from four to five months. In two other cases he obtained improvement, and in one of these complete cure may be expected. The heart was watched carefully after the operations, but in none of the four surviving patients was a permanent impairment observed. Electrocardiographic tests made two weeks after the operation and repeated several times always disclosed normal heart action. The mode of action of the lobovenoligature is not completely understood as yet. At any rate its action differs from that of collapse therapy, particularly thoracoplasty. The venous stasis does not cause shrinkage or a compression of the cavernous walls, but a network of strands develops and the cavity becomes filled out.

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18: 1-123 (No. 1) 1938. Partial Index

Some Cases of Hemorrhagic Metropathia and Secondary Amenorrhea Treated with Gonadotropic Substance. E. Rydberg.—p. 1.
*Causes of Fatalities During Labor: Statistics of Women's Clinic in Helsingfors. L. Leidenius.—p. 24.
Gestation Apoplexy Without Albuminuria: Case. A. Apajalahti.—p. 31.
*Premature Rupture of Membranes. P. Wetterdal.—p. 45.
Can Histologic Structure of Fetal Membranes Influence Time of Rupture of Bag of Waters? A. Apajalahti.—p. 57.
Endocrinologic Studies on Rats with Bisected Stalk of the Hypophysis. A. Westman and Dora Jacobsohn.—p. 99.

Fatalities During Labor.—The statistics presented by Leidenius include all fatalities that occurred in pregnant, parturient and puerperal women during the two decades from 1914 to 1933 at the obstetric clinic of the University of Helsingfors. The total number of deliveries was 47,793. In order to determine whether the mortality rate underwent changes, the material is divided into two groups, the first one comprising the material of the first decade (1914 to 1923), the second one that of the second decade. During the first ten year period the number of deliveries was 22,196. The total mortality during this period was 0.45 per cent. Among the fatal cases there were a considerable number in which not the process of gestation but conditions such as tuberculosis or pneumonia were the cause of death. The latter mortality is referred to as "indirect." During the first decade the indirect obstetric mortality amounted to 0.11 per cent, the direct one to 0.34 per cent. During the second decade the number of deliveries was 25,597 and the total mortality was 0.38 per cent, of which 0.05 per cent was indirect and 0.33 per cent direct. The most important causes of death in the two groups were respectively infection 61.8 and 45.9 per cent, toxicosis 23.7 and 27.1 per cent, hemorrhage 9 and 8 per cent, cardiac defects 5 and 12 per cent and embolism two and four cases. About 50 per cent of the patients who died were already infected or even moribund at the time of hospitalization. If these cases are excluded the total mortality is 0.18 and 0.17 per cent, respectively. In the concluding discussion the author directs attention to the importance of heart disease as a causal factor in obstetric mortality. He also stresses the necessity of supervision and financial aid during the period of pregnancy and he recommends the foundation of maternity hospitals that are within reach of every pregnant woman.

Premature Rupture of Amnion.—Wetterdal bases his discussion on 1,022 cases in which the liquor amnii was discharged before the beginning of labor. He distinguishes two categories: cases in which the delivery is quick and which present only few complications and cases in which the delivery is slow and the complications are numerous. Particularly risky are the cases in which faint ineffective pains set in shortly after the passage of the waters. The author is of the opinion that the ineffective pains and not the premature rupture of the membranes is the primary factor in such cases. An examination of 150 cases in which the waters escaped before the onset of the pains shows that in some of these cases uterine contractions occurred even before the perceptible pains began but that in the majority of cases no labor pains can be traced to the time of the passage of the liquor amnii. Consequently the suggestion that the rapid deliveries in cases of premature rupture of the bag of waters are due to the fact that a smaller or larger portion of the process of labor has already taken place before the rupture of the membranes cannot be applied to all cases. In 312 cases in which the waters escaped before the onset of the pains, studies were made on the primary and late mortality as well as on the physical and mental development of the children up to the age of 12. These 312 cases comprise 221 spontaneous deliveries and ninety-one forceps deliveries. A comparison with figures from an earlier report show that the premature escape of the waters influences neither the mortality nor the percentage of mental or physical defectiveness in the children.